Products finishing

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APRIL 1950

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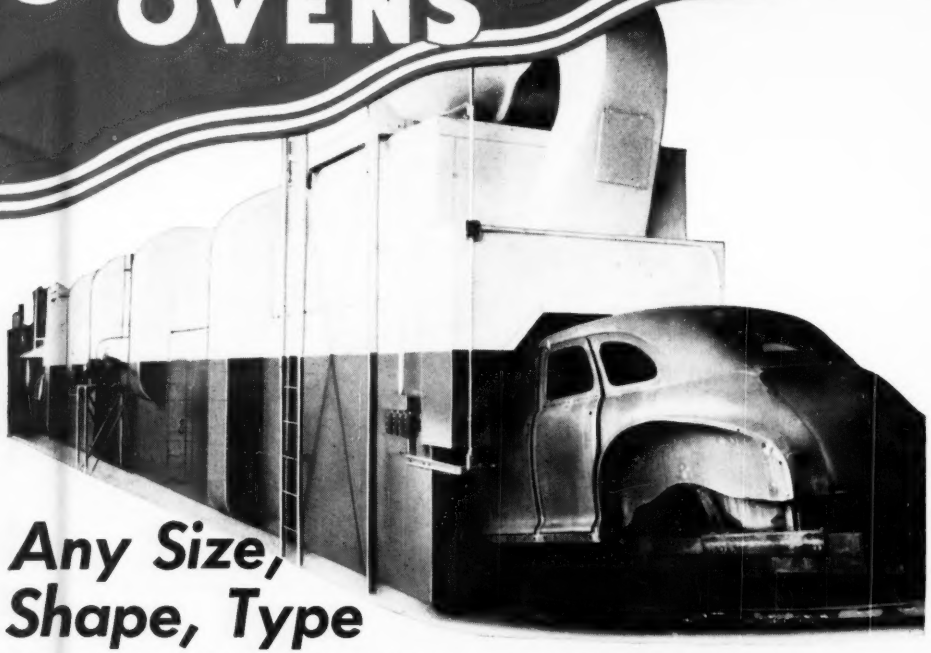

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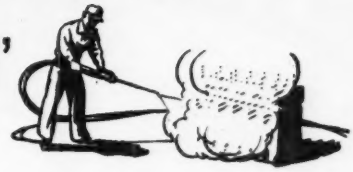

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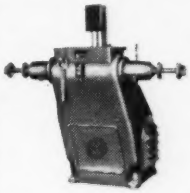

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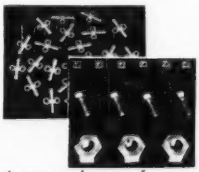

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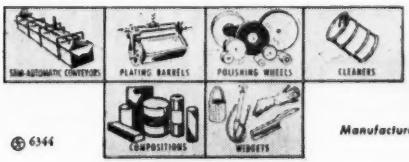

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Products finishing

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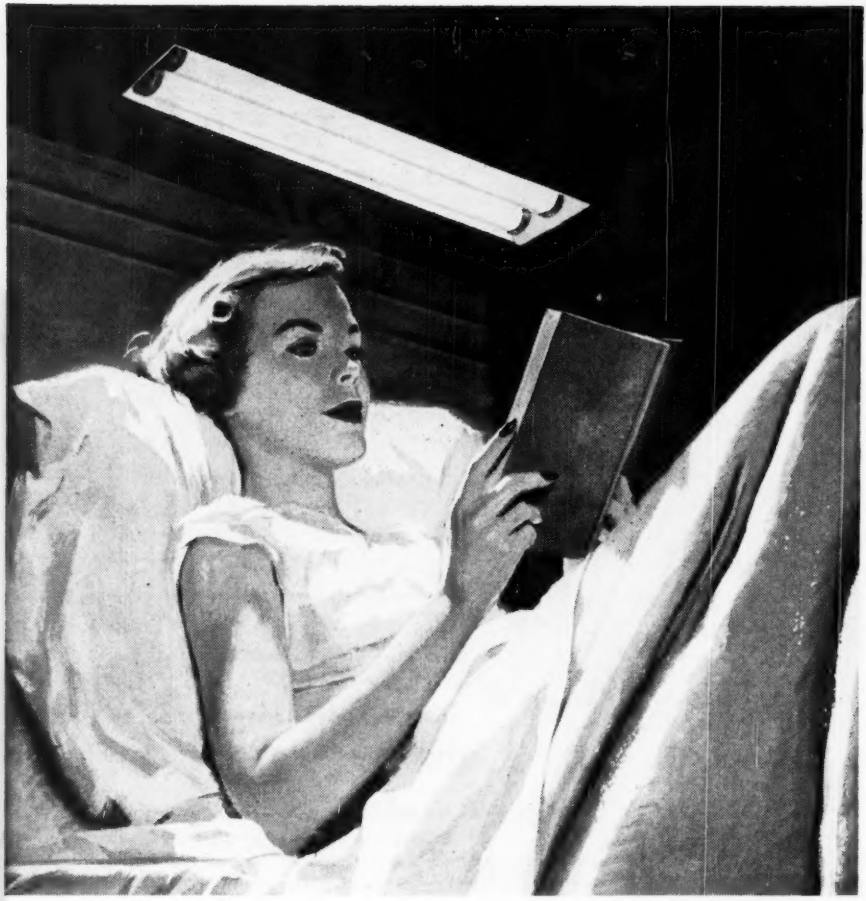

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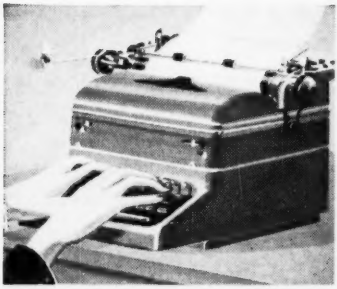

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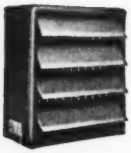

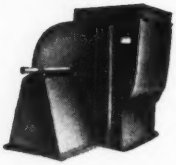

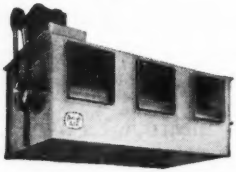

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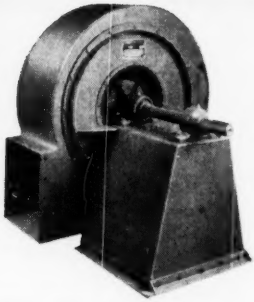

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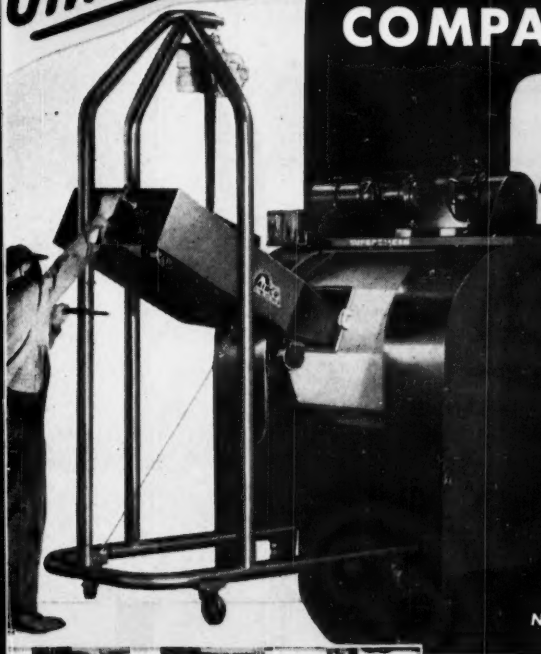

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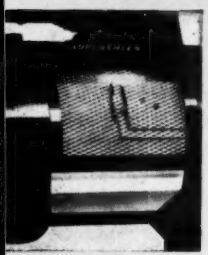

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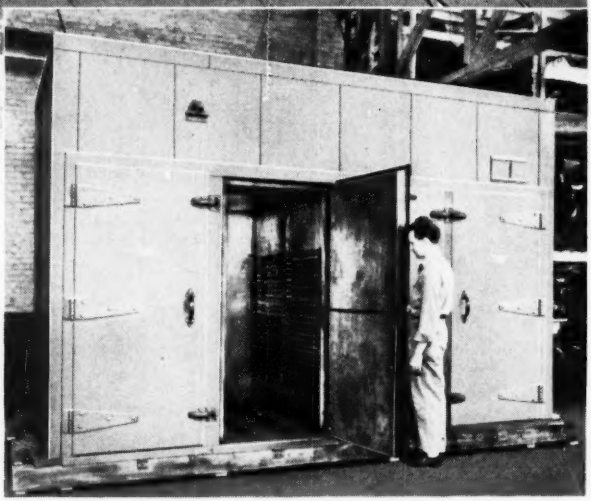

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Pf editorial

Vol. 14, No. 7

APRIL, 1950

The Process Engineer

Our complex and specialized industrial production organizations have, in their process of development, required in their engineeers more concentrated special engineering skills than could be included in the broad fields of the conventional varieties of engineers; namely, aeronautical, chemical, ceramic, civil, electrical, mechanical, and metallurgical. Among the many new titles indicating more specialized engineering knowledge is that of Process Engineer. Such an individual assists the superintendent or department supervisor in planning production and keeping it moving.

Since a great number of process engineers are concerned with finishing processes, it is worth while to see just what qualifications mark these individuals, and what they contribute to the manufacturing organization.

The Process Engineer may have obtained a college degree in any one of the fields mentioned; that is only a base upon which to build. Since the Process Engineer in most plants has to be concerned with finishes on metals, he must know metals as well as chemistry, because all finishing processes are fundamentally chemical or electrochemical processes. Since he has to plan material movement, he has to understand handling and conveying machinery. To ensure proper efficiency and optimum utilization of floor space, he has to know something about time study and processing cycles. Since he has to use electrical equipment, and electric current for electroplating processes, he must know electricity and electrochemistry. Since he must worry about the quality of the finished product, he must understand inspection and testing methods. And, last but not least, since he is daily called upon to find causes of imperfect work and scrap losses, he must be a good detective.

The Process Engineer makes a substantial contribution to manufacturing success. No plant should be without him.

E. A. Blount

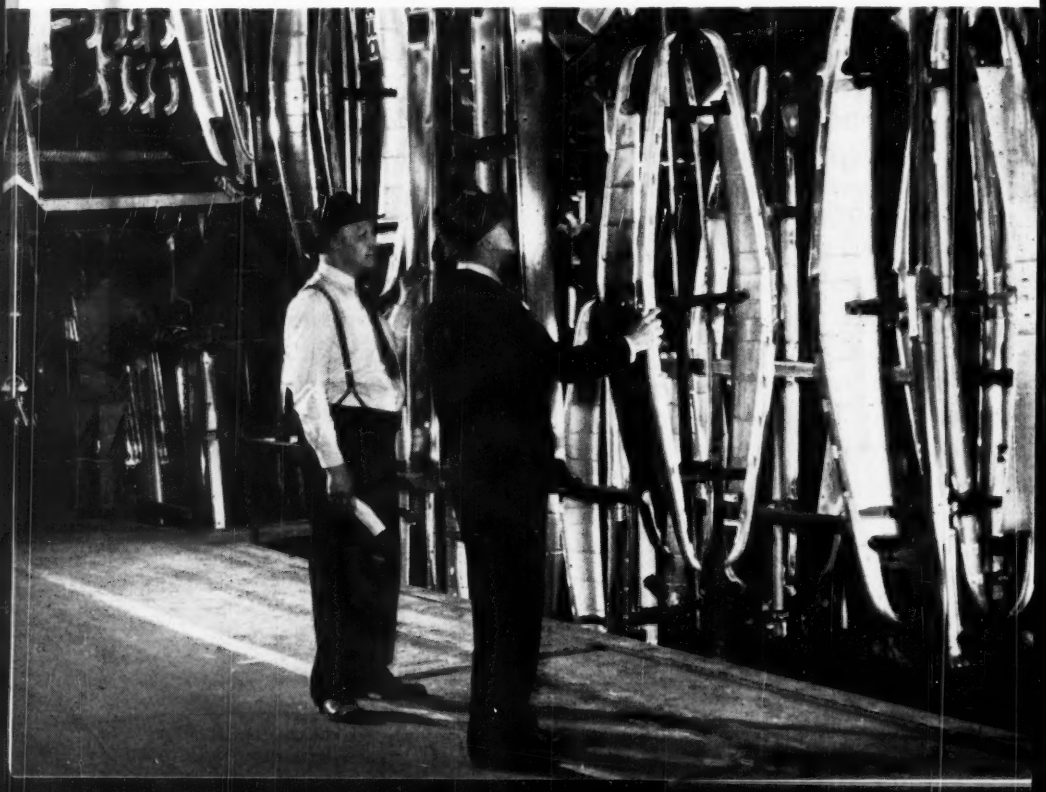
Electroplated Metals in the Auto Industry

By S. E. SANGSTER

ONE important segment of the auto industry that little is heard about is the electrochemical section, a vital part of the large manufacturers' research laboratories. Just as the body engineers and the metallurgists are continually in search for improvements in design and metal alloys, the science of electrolytic deposition of various metals on steel is contributing in no minor manner to the production of the modern auto.

The constant research conducted by these electrochemists, working in close cooperation with the research activities of the American Electroplaters' Society, has achieved much in developing the long sought quality control of precision plating and in perfecting better techniques and new ap-

Fig. 1—Many millions of car bumpers and grilles were finished with bright chromium plating over under-platings of copper and nickel for 1949 cars. In the accompanying photograph we see some of these on the conveyor line as they leave the chromium plating tank en route to the stockpile. All such plating is rigidly controlled to specifications and for quality.



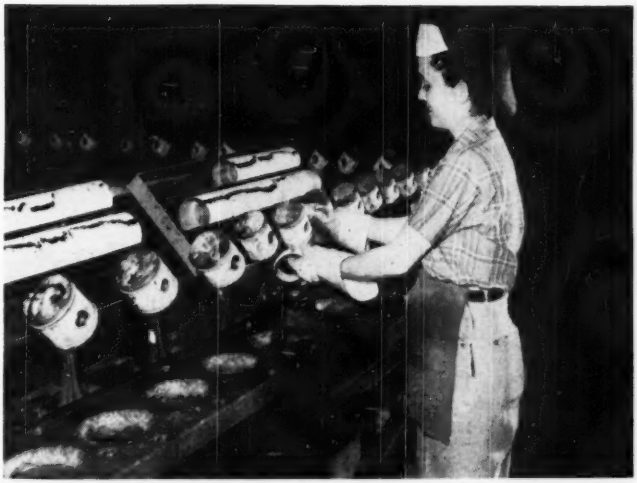


Fig. 2 — Electrotin plating of motor pistons and piston rings, in growing use in the auto industry, serves to provide better lubrication and retard abrasion. Here we see a conveyorized line of plated pistons on which the plated rings are being inserted.

plications. One of the principal achievements of electroplating is its use in various present day applications for the purpose of reducing body and motor corrosion.

Just how extensive is the use of electroplating in the industry may be seen in the following statistics, obtained by W. M. Phillips, director of electrochemical research, General Motors Corp., and just released by the A. E. S. An investment of $170,000,000 has been made by the auto industry in plating plants and equipment, exclusive of the value of buildings in which such are housed. The plating activities now carried on by the industry require the services of 34,000 employees. There is an average plated area per car today of 50 sq. feet; on a 1949 basis of 6 million units, the value of this plating exceeds $300,000,000, Mr. Phillips has stated.

The industry, he points out, is the major one in the nation employing electrolytic applications of a variety of coating metals. These include in addition to chromium, both bright and porous, huge quantities of nickel, copper, zinc, cadmium, tin, brass, lead and some silver. The total area of last year's cars plated with chromium alone would provide a ribbon of plate 1 yard wide stretching entirely around the earth at the equator.

The plating of parts now accomplished in the industry has become possible only as a result of the fully automatic conveyorized plating line, which was first employed in the industry and is now in common use in many other industrial fields.

We are all familiar with the bright chrome plating that is seen on the bumpers, grille, trim and exposed hardware of the present day automobile. This provides a highly decorative value to the unit; however, it also serves the functional purpose of protecting the nickel plating underneath. It is, however, on the hidden parts of the car that many of the most important electroplating appplications are made. Mentioned by Mr. Phillips is the growing use by some manufacturers of tin plated cast motor pistons and piston rings, which provides greater lubrication and greatly retards cylinder wear through corrosion. Another post-war plating application on some cars is the electrolytic deposition of zinc on all exposed underbody nuts and bolts and such concealed hardware as

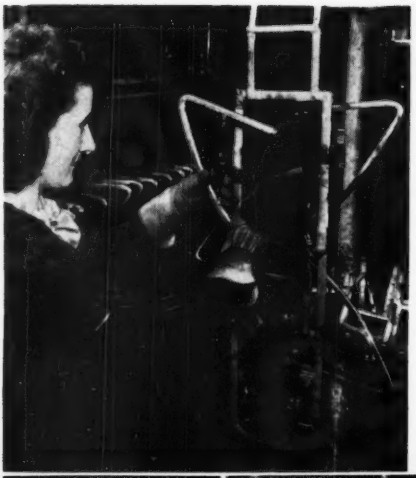


Fig. 3 — Mass production of millions of auto parts, each chromium plated to specification, is possible today as the result of the introduction of the fully automatic conveyorized plating line. In the Detroit plant where this picture was made, up to a half-million such parts as shown are electroplated with copper, nickel, and bright chromium during a full-operation working day.

door locks, and also the plating of many screws and "bits and pieces" with cadmium to retard corrosion and extend the useful life of the parts. An interesting application that has come with the development of higher-powered heavy-duty motors is the plating of the overlay of the new tri-metal

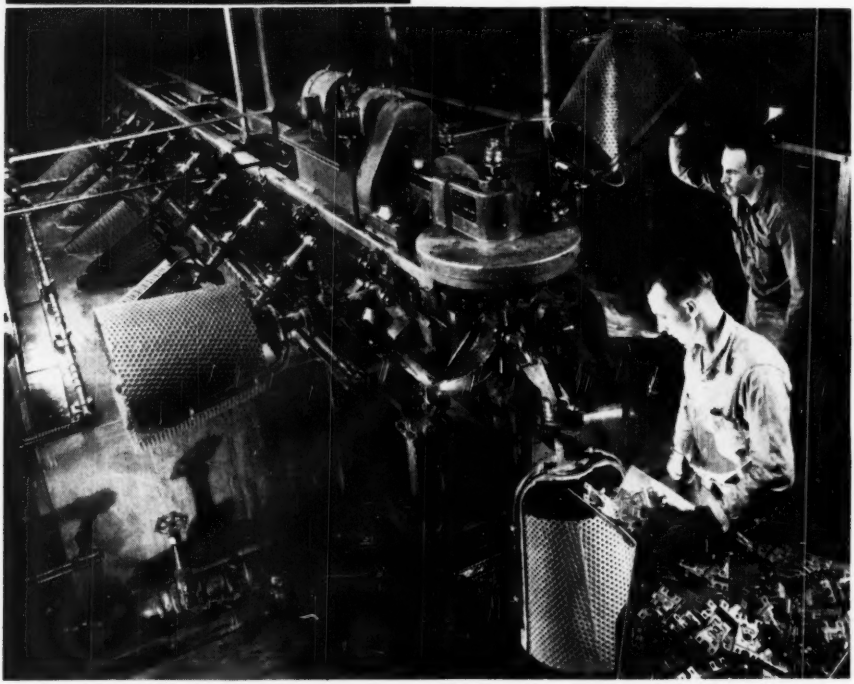


Fig. 4—Many millions of nuts, bolts, and other exposed underbody parts that go into today's auto are daily electroplated with zinc to retard corrosion. Shown is a typical zinc plating tank in operation on auto parts in a major automobile plant.
(All photographs courtesy General Motors Corp. and American Electroplaters' Society)

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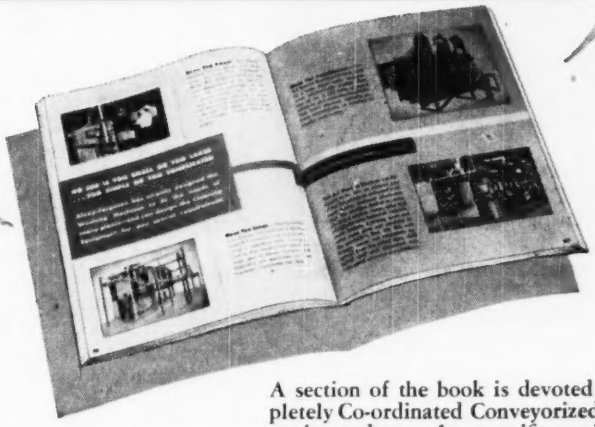

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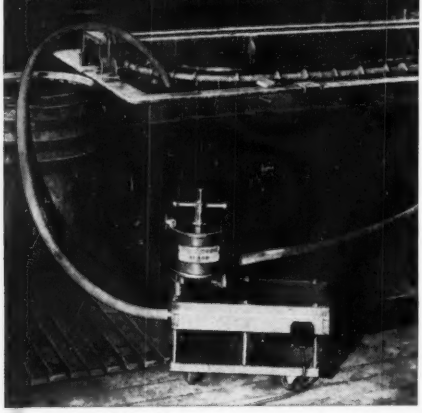

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bearings with a "white metal" alloy, in order to provide greater strength and increased fatigue resistance. In providing the car with a vibration damper, which serves to eliminate the vibration of the crankshaft and make possible a smoother ride, the practice followed involves the plating of one piece of the damper component with brass, in order to obtain a satisfactory bond with rubber. Plating of one of two small mating parts (of which there are several in the modern car) with tin, to retard the "fretting" otherwise occuring as a result of the constant vibration of these parts constitutes another little-known plating application. The use of copper plating on various car parts that require selective hardening is important; the copper coat serves as a "stop-off", to protect the portions that are not to be carburized.

Electrochemical research in the industry is steadily finding new plating opportunities. Among such that may be looked for in tomorrow's auto will be plated plastic hardware and other parts. The science of precision electroplating is definitely contributing to the production of cars that give better performance, last longer, and are safer to drive at high speeds.

A development of great value to the manufacturers of automobiles has been the perfection of a method by which wood tones and wood designs are pre-printed on a large flat metal sheet before fabrication into instrument boards, moldings, and parts for interior trim. Great simplification, time-savings and avoidance of much handwork are thus achieved. First, the primer and ground coat are applied. Next comes the printing of the graining or wood tone design. Third, the application of the final glaze coat of lacquer. A unique feature of the new method lies in the engineering of the photographed design to allow for distortion of curves and angles of the car interior, which parts were previously finished by hand.

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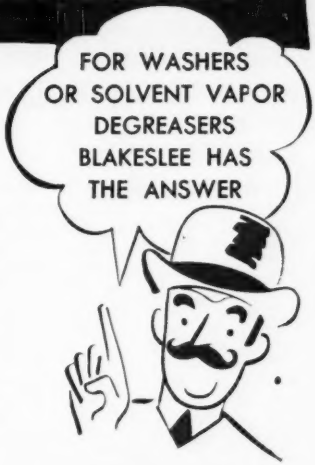

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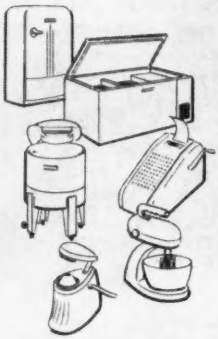

Alkalies, acids and other chemicals can play havoc with the toughest of ordinary finishes. The photographs above show two-coat systems on black iron buckets, using conventional appliance enamels, air-dry and baked . . . and SUPERCLAD. See what happened when the buckets were filled with 10% caustic soda and 10% sulfuric acid solutions!

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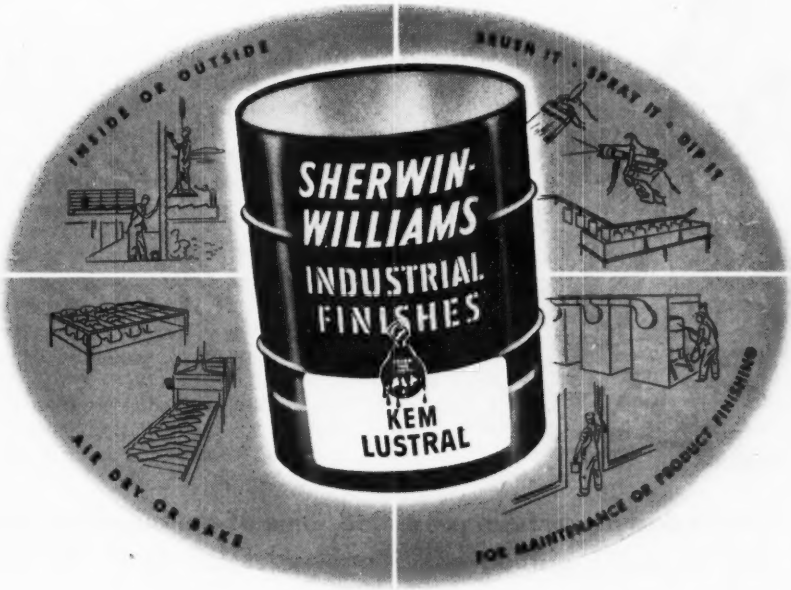

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SHERWIN-WILLIAMS INDUSTRIAL FINISHES

Finishing Clinic

In this department are presented some of the questions submitted by readers together with suggested solutions of the problems outlined.

Question. *Will you please recommend some firms who can advise us as to the proper equipment needed to produce a satin finish on aluminum?*
F. J. C.

Answer. The following companies can furnish equipment to assist you in your problem of producing a satin finish on aluminum and can advise you concerning details of the method (names of ten companies furnished).

Relative to the matter of satin finish on aluminum, you might be interested in the following quotation from "Finishes for Alcoa Aluminum," published by the Aluminum Company of America, Pittsburgh, Pennsylvania:

"Satin finish is a modification of the scratchbrush finish obtained by treatment on the metal with a finer wire brush wheel or by abrasives. It imparts a soft, smooth sheen with lower reflectivity than a highly polished surface. The soft effect results from the tiny parallel lines scratched on the metal. Various effects may be obtained by changing the angle of contact of the surface with the wire brush. Wires of 0.002 inch to 0.005 inch in diameter are most often used; the finer the wire, the finer the texture of the finish. Some difficulty may be experienced in applying this finish uniformly to large areas.

For some surfaces, like the inside of cooking utensils, the same kind of satin finish may be obtained without the use of the wire brush. The object may be rotated in a chuck while holding an oily abrasive cloth firmly against the surface as it revolves. A further rubbing with steel wool dipped in oil and emery powder and a final cleaning with a rag while the article is still revolving give a bright silvery finish. Steel wool lubricated with soapy water or greaseless polishing compounds can also be used to satin finish aluminum very satisfactorily.

"To produce a satin finish on castings, their surfaces must first be polished as described under highlighting.

After the use of the No. 180 emery, the surfaces are buffed with muslin or felt wheels with greaseless polishing compound. Various grades of greaseless compounds give a coarser or finer finish, depending upon the grain size of the abrasive contained in the compounds. A very fine satin finish may be obtained by using a rotary fiber brush or rubbing by hand with a paste made of pumice and oil.

If the surface of the casting, after the basic polishing operations with No. 120 and No. 189 emery, is buffed with a muslin or felt wheel and emery cake, a satisfactory base for a wire brush satin finish is obtained. On large flat surfaces, a fine, mild sandblast before wire brushing is quite essential to maintain a uniform satin appearance. Before using the wire brush, the prepared surface must be thoroughly cleaned of grease and dirt with a suitable solvent or by means of preheating for ½ hour at 400 deg. F. to 600 deg. F. (This method cannot be applied in the case of heat-treated castings, because of the adverse effect on their mechancal properties and dimensions.)

A 6-inch diameter wire brush made of nickel, stainless steel, or German silver wires 0.004 inch to 0.010 inch in diameter and operated at 450 r.p.m. to 600 r.p.m. is used to give the desired satin appearance. As with the regular wire brush finish, these wheels should be cleaned frequently.

"A finish closely approximating the true satin finish can be obtained with a belt sander when surface conditions permit the use of this equipment. By using belts of Nos. 80, 120, 180, and 240 emery and a belt speed of from 2400 to 3000 feet per minute, a finely cut surface is produced. By hand finishing with pumice or steel wool and kerosene, a still finer finish is obtained."

Question. *We are interested in obtaining facts about the relative advantages of electroplating nickel and chromium on steel as compared with copper, nickel, and chromium on steel.*
G. G.

Answer. Extensive research has been conducted on this very problem and the decision as to which system to use depends upon the conditions of exposure under which the finished product must operate. For example, automobile bumpers made of steel are nickel plated over a copper flash to a thickness of 0.0015 inch, then buffed and chromium plated. Bumpers have to stand up under very severe exposure conditions.

Corrosion tests have established the fact that nickel and chromium coatings over steel corrode more rapidly when an intermediate copper coat is used. Copper on the other hand appears to reduce the rate of corrosion in the carbon dioxide-saturated hot water test. Where exposure conditions are severe, the logical plating cycle to use to produce chromium coatings over steel is as follows:

1. Copper flash (to secure adhesion of the subsequent bright nickel to the steel)
2. Full coat of bright nickel
3. Such buffing as may be necessary
4. Final chromium plate

This system substitutes whatever touch-up buffing of the nickel may be necessary for the buffing of a heavy copper plate which would have to be performed in the case of the copper, nickel, and chromium system.

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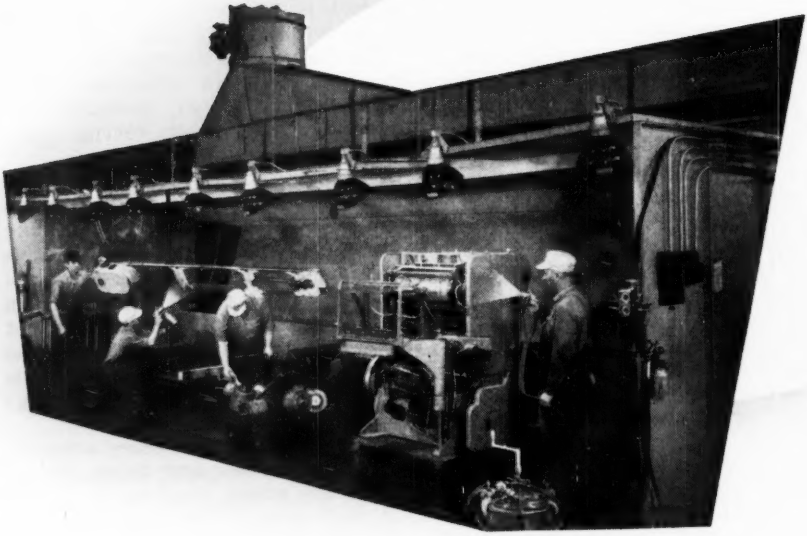

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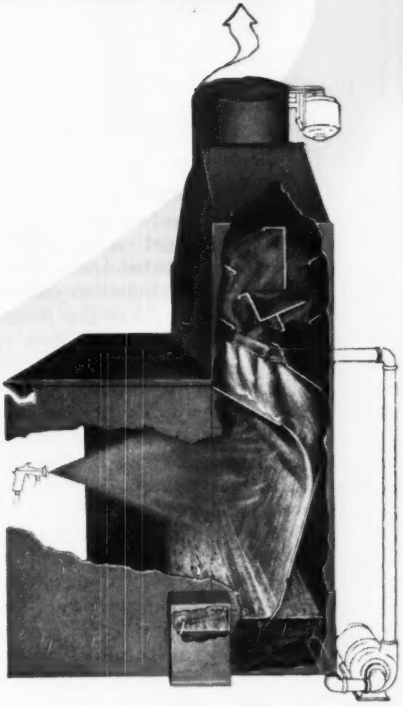

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EXHAUST SYSTEMS
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The Law and The Metal Finisher

Part I

By BRYANT W. POCOCK

OF all human relationships there are few indeed having more practical import and significance for the plater and finisher than that which exists between parties to a contract. Almost all of the finisher's business is based on the law of contracts. Whenever he accepts an order, or whenever he himself orders materials or services, he places himself under contract. If he buys or sells anything, if he negotiates for additions to his plant or equipment, if he hires or fires, or if he bargains with his union collectively or with his employees individually, his activities are governed under the law by those fundamental concepts which the courts of the land have come to associate with this instrument many of us think of all too lightly as just a contract.

The mere fact that the courts are kept busy settling disputes which arise over contracts should be evidence enough of their importance. Contracts have upon occasion been known to ruin individuals financially and morally, and have driven reputable firms into bankruptcy. They have put huge corporations out of business overnight, yet contracts have made millions for other corporations. Modern business in general is contractual, as is much of our everyday lives, so it is the part of wisdom to acquaint ourselves with the nature of contracts in order that we may use them to our advantage and not to our detriment.

It has been said that a contract cannot be considered valid and enforceable unless it fulfills all of the requirements as set forth in the following statement: "A contract is an agreement, duly made, by competent parties for a legal consideration to do or to refrain from doing a lawful thing or things." This is probably the simplest all-inclusive definition of a contract that can be devised, and most textbooks on the law of contracts quote it almost verbatim. It can be safely accepted that a given contract will contain all of these requirements or it is not a contract in the eyes of the law.

Like many beautifully simple things, however, the definition of a contract becomes more complex the further we examine it and learn to appreciate its many implications. Take, for example, the first and most fundamental element of a contract, the fact that it constitutes an agreement. An agreement would certainly appear to be a simple and forthright concept. Yet many things, it turns out, appear at first glance to be agreements, yet are not. If you agree, for instance, to take on a certain job in your plant, this does not, paradoxically, comprise an agreement. Under the law it is an of-

fer, and in order that it may become an agreement your offer must be accepted. Offer and acceptance, then, are both necessary before the law recognizes an agreement to exist.

Let us assume that you own and operate a plating and finishing plant, and that you are anxious to take on more work. You notice in the morning paper that the proposed grade separation at the intersection of Main Street with the Pennsylvania Railroad tracks in your city has finally been approved, and that the city engineer is advertising for certain bids. You decide to bid on furnishing 2000 zinc-plated dowel sleeves and 72,000 sq. ft. of phosphatized reinforcing steel. You figure that you can supply these items for $24,000 and realize a profit of $2,500; so you mail in your bid accordingly.

Your bid is in effect your offer to do certain work for a stipulated price and remains an offer from the moment you dropped it into the mailbox until it is accepted or rejected. You are bound by law to fulfill your offer if it is accepted as you presented it. If it is not accepted precisely as you presented it, you are not bound to proceed. An agreement must be a true meeting of the minds.

Offers may be made in other ways. For example, they may be telegraphed, or they may be made orally in person or by telephone. Actually it is possible to transmit an offer by smoke signal, as the law says merely that it must be communicated. Offers must, however, be definite and they must be made with contractual intent. Ambiguity with regard to the thickness of zinc plate on the dowel sleeves in the above bid could give rise to a misunderstanding and in turn to resultant litigation. An offer without contractual intent has no meaning under the law.

Although the life of an offer expires upon its acceptance, in which case it becomes an agreement, or upon its re-

Bryant W. Pocock

BRYANT W. POCOCK is no stranger to the readers of PRODUCTS FINISHING, having served as consulting editor from January 1943 to June 1947. He is the author of a number of articles published in PRODUCTS FINISHING and other magazines describing various aspects of finishing and finishing installations.

His educational background includes an A.B. from John Hopkins University in 1927, M.A. from the University of Michigan in 1934, and two years of study (chemistry) at the Ludwig-Maximilians Universitat Munchen and the Privatlaboratorium Benders und Hobeins in Munich, Bavaria, Germany.

Mr. Pocock has been associated with the Michigan State Highway Department as chemical research engineer for a number of years. For one year he was director of research for the Keystone Asphalt Products Company, and for two years during World War II was chief chemist for the Nash-Kelvinator Corporation, Propeller Division Plant No. 1, Lansing, Michigan.

Included in Mr. Pocock's scope of interests are memberships in the Lansing Engineers' Club, the Michigan Engineering Society, and the Royal Astronomical Society of Canada. He is a registered professional engineer in the State of Michigan.

jection, an offer may by its wording automatically cease to exist after the expiration of a stipulated period of time. In cases where no time limit is referred to in the wording of an offer the courts recognize the salutary effect of permitting a reasonable period of time to elapse before the offer dies; for it is obvious that offers are not meant to last forever. An offer cannot continue after the death of the offeror; likewise it cannot endure if the offeror suddenly takes leave of his senses. Death and insanity are therefore acknowleged by the law to nullify offers.

An offer may be revoked by the offeror provided notice of revocation is received by the offeree prior to acceptance. This rule of law bears a certain resemblance to the rules of contract bridge, whereby it is usually permissible for a player to withdraw a play provided he does so before the play has been accepted as evidenced by the next player playing his card. It is therefore apparent that although an offer is presumed to exist once it has been deposited in the mailbox (because the offeror has no control over his letter once it has been mailed), this is not true of notice of revocation. The offeree may have decided to accept the offer during the time between mailing of notice and its receipt.

There is still another important consideration with respect to revoking an offer. The law stipulates in the public interest that revocation of an offer made in good faith and in the form of a definite bid is not ordinarily permissible in matters pertaining to public works. Therefore in the case of the above bid, the bidder is obligated from the moment he mailed his bid, and all he can do is hope that he hasn't made a mistake. If costs go up and he stands to lose his shirt there is nothing he can do about it. The law presumes that the bidder is intelligent and has ac-

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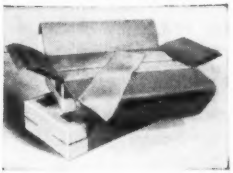

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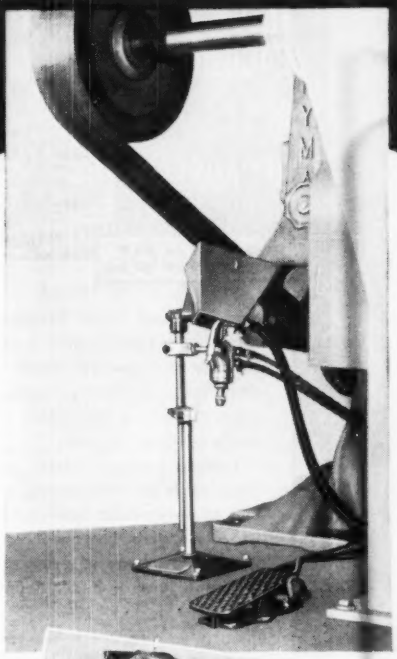
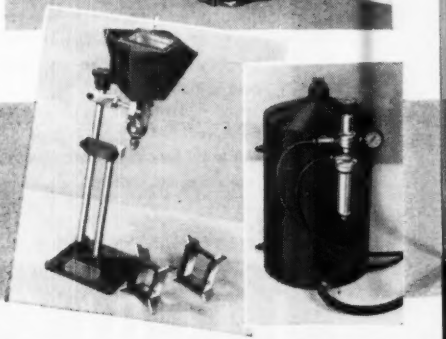
One user tells us BELT-LIFE has increased belt endurance, polishing steel parts, from three to 21 hours since replacing previous grease stick application. Another, on zinc die-castings, averaged three belts per shift; SPRAY-MATIC-applied BELT-LIFE increased belt productivity to 16½ hours per belt. Both reported higher quality, lowered time.





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quainted himself with all the facts pertaining to his bid, and has normal ability to exercise sound judgment.

Acceptance of an offer under the law converts the offer into an agreement. In order for the courts to uphold it, however, the acceptance must be complete, absolute and unconditional. It must be in all respects identical with the offer or bid. Suppose for example after all bids in the instance cited have been opened that your bid is found to be low and is therefore acceptable. Suppose it is not accepted at once, however, because the city engineer now wishes to insert a clause stipulating that the m i n i m u m tensile strength of the steel reinforcement shall be 65,000 lb. per sq. inch. You are notified to that effect, and in so being you are by law relieved of all responsibility, for your bid is thereby nullified and voided. You may counter propose with another bid if you wish, or you may simply forget the whole business. In either event you are wise to communicate your intention.

Although an offer under the law must be communicated in order to be legal, acceptance need not be. Acceptance, peculiarly enough, may be revealed by action alone, accompanied by complete silence. If **A** says to **B,** "I'll sell you my car for $500, and **B** says nothing but pulls out his wallet and hands **A** the money, **B** from that moment on owns the car. Ordinarily, however, especially in matters affecting the public interest, notification of acceptance is given, if only as a matter of good business procedure.

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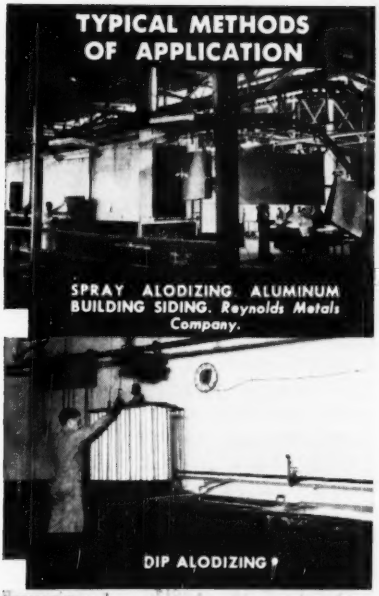

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Magnesium Processing and Finishing

By GILBERT C. CLOSE

FEW firms who use magnesium as a production or structural material are faced with greater corrosion prevention problems than those aircraft companies who are engaged in the production of carrier-based Naval airplanes. Chlorides, which are very prevalent in sea atmosphere, are extremely destructive to magnesium. Unless the metal is fully protected from contact with these chlorides, its useful life is limited.

The El Segundo plant of Douglas Aircraft Company has had ample opportunity to study the effects of sea air on magnesium components. This company has been busily engaged in producing carrier-based dive bombers and attack bombers since long before World War II. Under the direction of S. H. Phillips, well known process engineer, the company developed a protective treatment schedule for magnesium which is proving effective in service.

Many of the processes used at the plant are not new, but are applied in the right combinations to produce best results. It has been discovered through careful and prolonged research that there is no one type of protective treatment schedule which will give best results under all conditions. Some treatment schedules, very effective under certain conditions, will be inferior to other treatment schedules when different conditions are encountered. There are also specific faults or dangers inherent in most surface treatment processes which must be recognized and for which compensation must be made during final finishing operations.

From the standpoint of corrosion resistance, greatly improved magnesium alloys have appeared within the past few years. These new alloys, coupled with constant research into surface treatment and top coatings, have expelled most corrosion dangers which kept magnesium from becoming an important aircraft metal years ago.

Magnesium, like all other metals, must be thoroughly clean before any type of surface treatment is applied. There is a common misconception among less experienced users that magnesium and aluminum have approximately the same sensitivity to cleaning solutions. This is true when certain commercially available clean-

ers are used. On the other hand, cleaners intended specifically for aluminum may attack magnesium severely, and vice versa.

A strong alkaline cleaner will react immediately with aluminum producing a severe attack; the same cleaner will not affect the magnesium alloys. Aluminum is impervious to nitric acid, but magnesium will suffer a severe etch in such a solution. Hydrofluoric acid will attack aluminum violently, but magnesium is not affected in hydrofluoric solutions in concentrations above 10 per cent. The best solution to cleaning problems with magnesium is to seek the advice of a competent commercial concern specializing in cleaning compounds.

In deep drawing magnesium at room temperature, a good grade of mineral oil blended with fish oil is often used. High temperature lubricants are used for hot forming and drawing operations at from 350 to 600 deg. F. These high temperature lubricants and drawing oils are usually a combination of natural fats, sulfurized oils and graphite. Graphite must be removed as soon as possible from the magnesium surface since it is corrosive in character. This removal may be accomplished by a ½ to 2 minute dip in a simple 15 to 20 per cent chromic acid solution.

In recent years, hot chemical dips have been used almost exclusively in the surface treatment of magnesium. The dips most frequently used include the chrome pickle (Dow No. 1) treatment, the sealed chrome pickle treatment, and the Dow No. 7 (hydrofluoric-sodium dichromate) treatment. The chrome pickle and sealed chrome pickle treatments are widely used on sheet stock and parts of non-critical dimensions, but cause a certain amount of etch or metal loss. The Dow No. 7 treatment does not etch and is widely

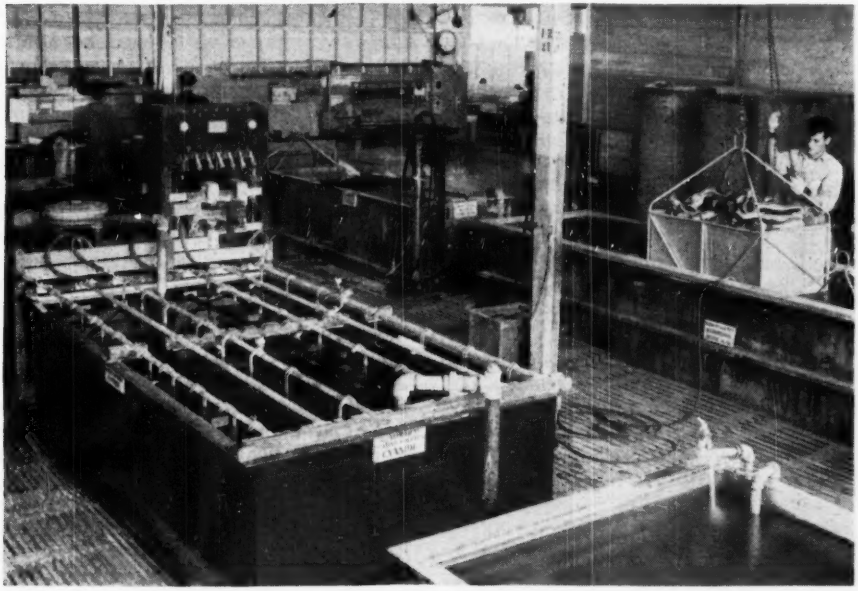

Fig. 1—A view of the metal cleaning and processing department of El Segundo plant of Douglas Aircraft Company.

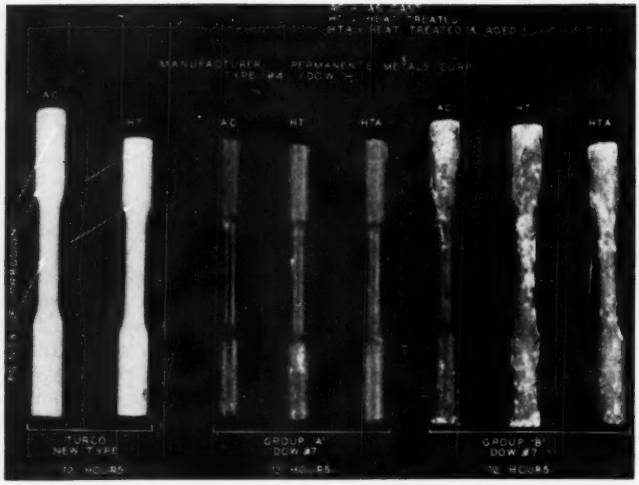

Fig. 2—As indicated on photo, the two magnesium test bars at the extreme left were given the Turco-Waterman surface treatment. The six bars to the right were given the Dow No. 7 (hydrofluoric-sodium dichromate) treatment. After 72 hours of exposure in the salt spray cabinet, only a few small corrosion pits appeared on the Turco-Waterman processed specimens. The other six bars were badly corroded.

used for the surface treatment of machined parts where maintenance of close dimensions is necessary.

Though these hot chemical dips will greatly increase the corrosion resistance of the magnesium alloys, they do not form a tightly adherent coating. Scuffing or abasion will remove the protective film exposing bare metal to corrosion.

A more recently developed anodic treatment called the Turco-Waterman process is rapidly gaining prominence in the aircraft industry. This treatment, originated by Dr. Waterman of the University of Southern California working in collaboration with A. L. Kohl of Turco Products Company, promises to be another stride toward preventing magnesium corrosion.

This is conventionally an anodizing treatment using a saturated sodium carbonate solution as the bath. The action of the treatment is to form a hard, white crystalline coating of magnesium carbonate over the surface of the treated metal. This coating is an electrical insulator in itself, is very resistant to abrasion and corrosion and forms an excellent paint base.

The magnesium alloy to be treated becomes the anode in the solution tank. The solution is heated to between 198 and 210 deg. F. Approximately 115 volts of direct current are applied. The initial current density will be about 100 amp./sq. ft., but this current density drops off rapidly as the non-conductive magnesium carbonate coating forms. At the end of the treatment, the current density will drop approximately 0.15 amp./sq. ft. of surface. Though the process is somewhat critical, all factors are easily controlled, and very similar results can be obtained from batch to batch. This treatment has proved highly effective in protecting most magnesium alloys including Dow numbers H, R, J, C, O, and FS-1.

Extensive tests conducted by the Douglas El Segundo process engineering department indicate the high efficiency of the Turco-Waterman process in comparison with older hot chemical dip methods of treatment—especially insofar as salt water and sea air corrosion are concerned. These tests were carefully supervised, and control panels were used to obtain good comparative results.

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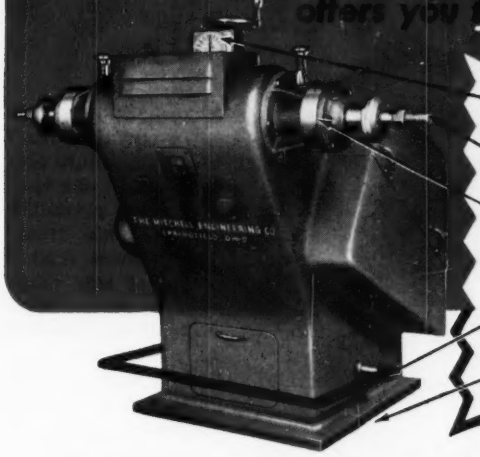

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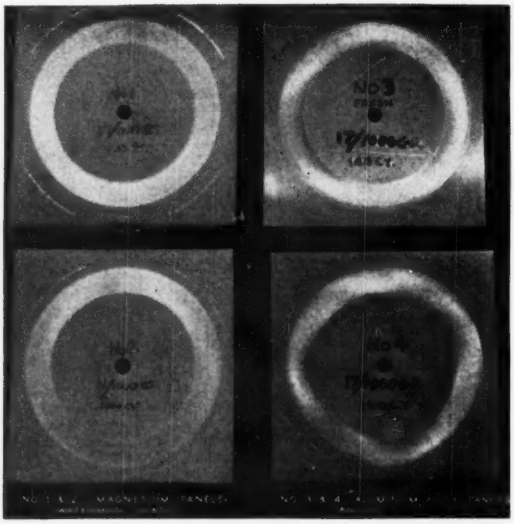

Fig. 3—The hardness and abrasion resistance of the coating produced on magnesium by the Turco-Waterman process is superior to other surface treatment results. The two magnesium panels on the left, after receiving the Turco-Waterman treatment, underwent 600 cycles (upper panel) and 1000 cycles (lower panel) using a 17/1000 gs. weight. Destruction of the coating is less than destruction of the anodic coating on the aluminum panels after only 100 cycles using the same weight.

In one test, J1-H magnesium alloy panels were surface treated using the acid-dichromate process, and like panels were treated by the Turco-Waterman process. After 56 days of exposure to sea air and spray, there were only a few very minor corrosion pits visible on the Turco-Waterman processed panels, while the acid-dichromate panels were badly corroded. None of the panels were painted or protected in any way except for the surface treatment.

In another test, one-half of a group of carefully prepared test bars was anodized by the Turco-Waterman process. The other half of the bars was distributed to various aircraft companies with a request to apply their own acid-dichromate treatment. The bars, both anodized and chemically treated, were then distributed to the cooperating companies and comparative tests were made in salt spray cabinets at each company. Test results in all cases were highly in favor of the Turco-Waterman process.

Other tests conducted at the Douglas El Segundo plant indicated the importance of proper paint coatings over the surface treatment to obtain maximum corrosion resistance. In one test, several panels were given the sealed chrome pickle treatment, and all were coated with two coats of zinc chromate primer. Half of the panels were painted with two coats of red aircraft gloss lacquer, and the others were painted with two coats of blue aircraft gloss lacquer. All panels were exposed to sea air and salt spray on the pier at Santa Monica, California, for a period of two years. At the end of this time, the blue painted panels showed only slight edge corrosion; the red painted panels showed edge corrosion with some surface blistering. Without paint, and with only the sealed chrome pickle treatment for protection, the panels would have corroded badly within 8 or 10 days.

A paramount requisite of all magnesium paint coatings is a high degree of moisture resistance. Moisture reacts with magnesium to produce magnesium hydroxide, a strong alkali which attacks most paints and lacquers. Once this hydroxide is formed and the paint is blistered away, the action is progressive, continuing along the edges of the blistered area and ever enlarging the area of attack.

One function of surface treatment is to keep any moisture that permeates

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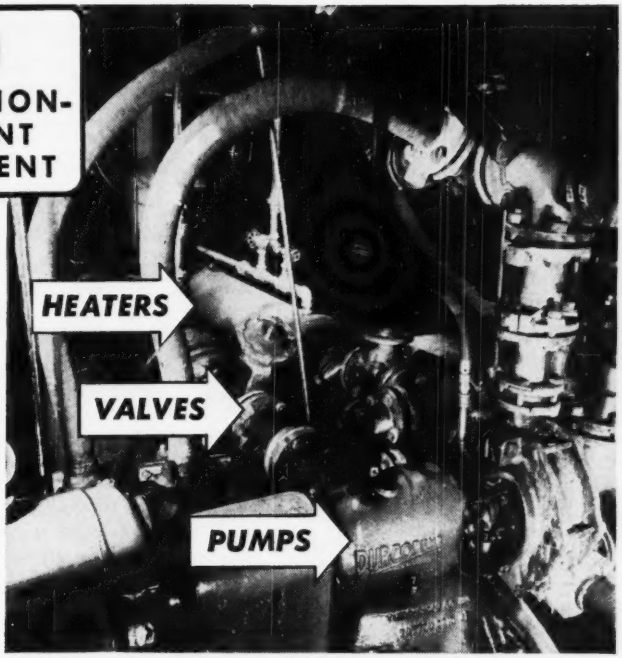

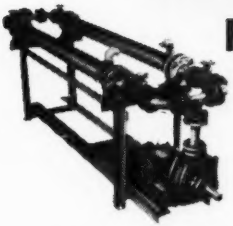

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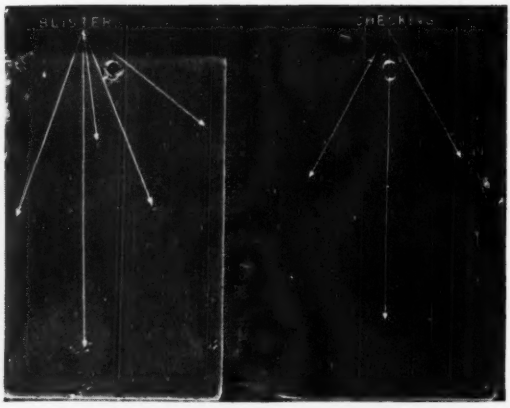

Fig. 4—The magnesium panel on the left was given the Dow No. 7 treatment; the panel on the right received the Turco-Waterman treatment. Both panels were painted with zinc chromate primer and aircraft gloss lacquer. They were then exposed for two years on the pier at Santa Monica, California. Only very little corrosion was evident on the Turco-Waterman processed panel. The other panel was badly corroded. (*All photos courtesy El Segundo plant at Douglas Aircraft Company*)

the paint coating from reaching the magnesium metal. When a scratch or mar occurs that ruptures both the paint coating and surface treatment, the area must be passivated and repainted immediately or progressive deteriorating action will occur.

Often when magnesium sheet and bar stock and other magnesium products are held in storage for a considerable length of time a slight amount of surface corrosion will occur. These corrosive products must be removed before the material is put into production, or before the parts receive final processing prior to assembly. Douglas engineers have found that a distilled water-chromic acid solution is very efficient for this purpose. Distilled water is used to make sure that no chlorides will be present.

Concentration of the solutions range from 5 to 20 per cent depending upon the condition of the metal. Temperatures range from room to 95 deg. F. The higher temperatures and concentrations are used for heavier corrosion deposits.

In a few test runs, Douglas engineers have employed a chromic acid anodic electrolyte for this purpose. The electrolyte is used at 95 deg. F., and chloride concentration of the solution is kept below 0.03 g./l. of sodium chloride. The tests were very successful and hold forth possibilities of a new method for removing corrosion products occurring during the storage period.

It should be noted, however, that both the chromic acid dip and the chromic acid anodic process destroy the surface treatment applied by the producer prior to shipment of the magnesium alloys. Parts and stock treated for removal of corrosion products gathered during storage should be put into production at once so that a surface treatment can be applied again as soon as possible.

At Douglas El Segundo, despite the fact that the company's airplanes are subjected to the most severe corrosive conditions, the day of holding the magnesium alloys under suspicion has long since passed. Rather, engineers have come to recognize the shortcomings of the metal, and are compensating for these shortcomings accordingly.

It has been found that with proper surface treatment, and with proper priming and painting, the service life of magnesium components is comparable with that of other metals. Success in the use of magnesium where it will be exposed to corrosive influences depends to a great extent upon carefully conducted tests to develop a finish schedule best suited to the medium in which the magnesium will be used.

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The background photograph shows grains of Exolon RST enlarged about 20 times.

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There are, however, two paramount requisites for all magnesium finishing schedules. First, the metal must be chemically or anodically treated to produce an inert, moisture resistant film that offers a good paint base. Secondly, the primer and paint coatings must be highly moisture resistant, and must form an unbroken and adhering film over the entire surface of the magnesium component or part. With these factors in mind, choice of the surface treatment to use and the types of primer and paints to employ becomes a simplified matter of good judgement and a few carefully conducted tests.

New Pigment Dispersion Process Eliminates Mechanical Grinding, Milling

A SIMPLE new chemical transfer process for the combination of metal pigments—free of water—with resins and oils has been perfected by The Commonwealth Engineering Company, applied research and development organization of Dayton, Ohio.

The new method substitutes kettle, heat control, and stirring apparatus for the heavy mills presently used to break down and disperse pigments into pastes.

Called the Kol process for the colloidal aspects involved, the method effects a complete and homogeneous dispersion which may be used for paints, plastics, inks, linoleums, or whenever a pigment paste is required.

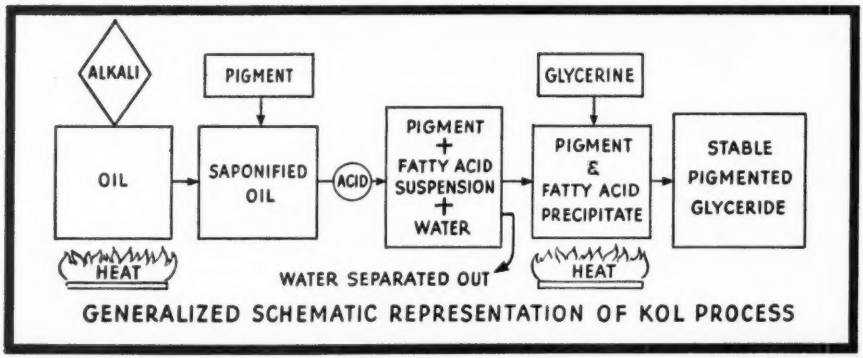
In the first phase of the process, the vehicle raw material is saponified by the addition of an alkaline agent. To it, under the influence of gentle heating, is added the pigment either as press cake or in a slurry.

The addition of a small amount of a weak acid such as acetic anhydride accomplishes the precipitation of the pigment and fatty acid oil components. The separated water is discarded.

Glycerine is then introduced and the mixture subjected to a heat treatment to esterify the fatty acids and produce the mono, di and tri glycerides of these acids. The resultant product is an oily pigment paste dispersion of smooth consistency, comparable to the present grinding-mill product.

In addition to pigmented oil gels, pigmented fatty acid glycerides, resins, and resin gels may be prepared by variant procedures under the foregoing method.

The new method, illustrated in the accompanying diagram, involves only the use of stainless steel containers,



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plus control heat for effecting the chemical reactions. Such equipment is the same as that normally used in the remainder of the processing which paints and plastic undergo, and hence can be integrated with the latter in a continuous process arrangement, eliminating the batch method now used. Besides introducing continuity of production, the new process is subject to a simple and sensitive control.

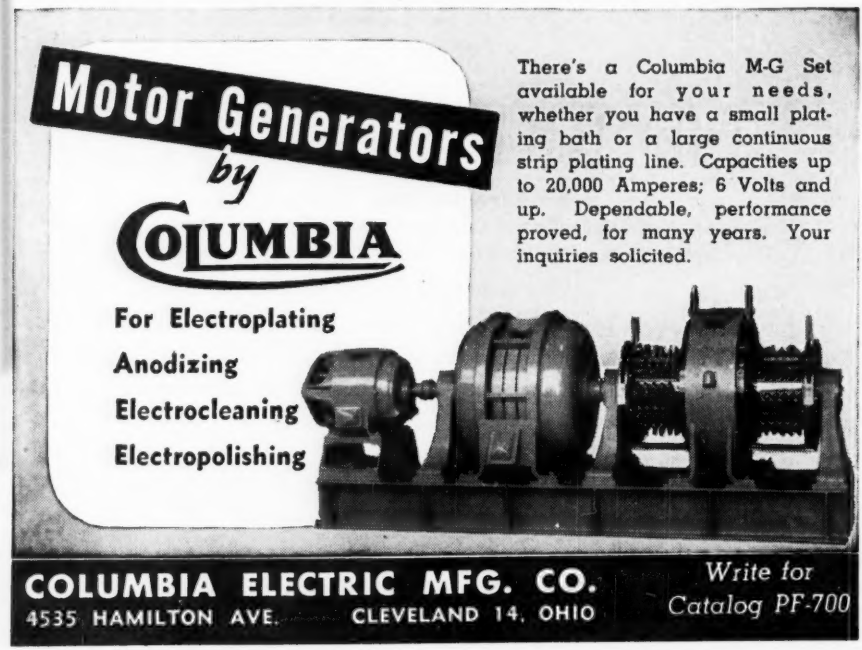
Trends and Developments in Organic Finishes

AT the close of World War II industry became entangled in a series of reconversion webs, and the thought and consideration for new and improved organic coatings was subordinated to more vital measures. Since 1946, however, users of lacquers, enamels, and synthetic coatings have become more and more cognizant of the degree to which competition has grown, and the need for improved products has become increasingly apparent.

Not only were the inherent characteristics of the given product carefully surveyed by the manufacturer, but attention was also focused on sales appeal. Manufacturers of industrial finishes played an exceedingly important role in providing industry "tools" with which to sell more goods by providing the "package" that ultimate consumers wanted to buy. "Eye appeal" has become the watch word of industry!

Design engineers, industrial designers, and stylists have become more prone to utilize finishes that produce a hammered effect; and particularly finishes that produce the hammered effect with one spray coat application.

Wrinkle enamels are still considered standard durable finishes and are used with colorful lacquer enamel topcoats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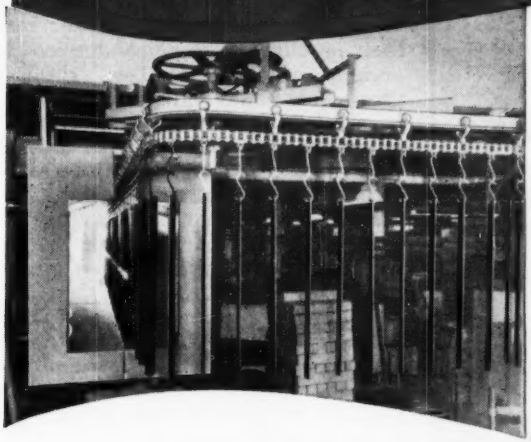

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Not only are manufacturers of organic coatings charged with the responsibility of producing superior quality finishes, but they are also called upon by manufacturers of products varying from diaper pins to caskets to suggest color combinations and patterns which lend themselves to the product in question and thereby enhance its sales value.

Progressive manufacturers in the field of organic coatings maintain regular market research departments wherein surveys and analyses are made in an endeavor to anticipate future market requirements, and the needs of product manufacturers who use lacquers, enamels and other organic coatings as surface finishes.—*B. F. Ames, Manager, Advertising and Sales Promotion, Mass & Waldstein Co., Newark 4, N. J.*

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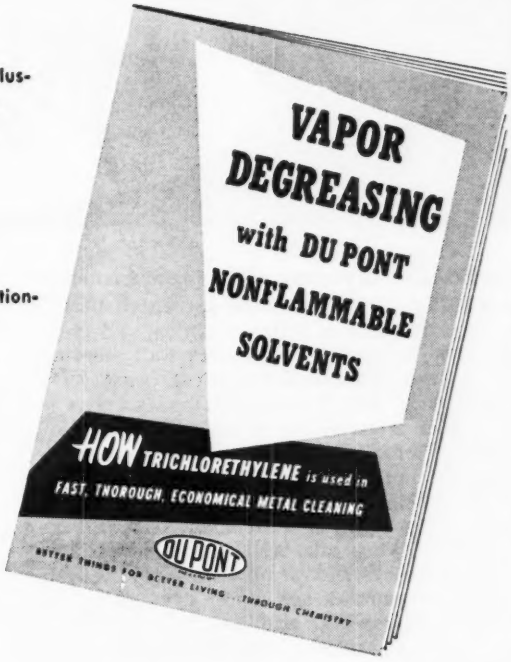
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A Monthly Digest of Current Technical Progress Indicating Significant Trends and Developments in the Finishing Industry

Styrene Co-Polymers in Organic Finishes

SEVERAL papers were presented before the Division of Paint, Varnish, and Plastics Chemistry at the 1949 Fall Meeting of the American Chemical Society, in Atlantic City, which indicated that styrene is becoming an increasingly important raw material for use in organic surface coatings. However at the present time, it is not used in coatings as the monomer nor as polystyrene but rather as copolymers with such materials as butadiene, drying oils, and alkyd resins. The advantages obtained from the co-polymeric products, in general, are faster drying, harder film and better water and chemical resistance than can be obtained with the straight oil or alkyd resins.

The method of preparation and properties of styrenated alkyd resins were discussed before the above meeting by N. R. Bhow and H. F. Payne, Polytechnic Institute of Brooklyn. It was shown that styrenated alkyd resins could be prepared by first styrenating the fatty acids followed by esterification with phthalic anhydride and glycerol. Three per cent benzoyl peroxide, based on the weight of the styrene used, was employed as catalyst in the reactions which involved tung oil fatty acid, oiticica oil fatty acid, dehydrated castor oil fatty acid, linseed oil fatty acid, and isomerized linseed oil fatty acid.

The styrenated alkyd resins were made by

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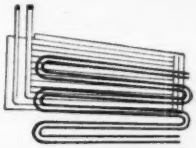
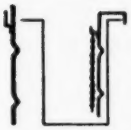


NO LOSS OF SOLUTION



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Kold-Hold Manufacturing Company, Lansing 4, Michigan

Table I
Clear Film Properties of Styrenated Alkyd Resins

Resin	Drying Time: Set to Touch, Min.	Dust Free, Hr.	Dry Hard, Hr.	Sward Hardness: Air Dry, Hours 24	48	168	Bake: 150 deg. F. 30 Min.	250 deg. F. 20 Min.	300 deg. F. 10 Min.
A	20	3	4	18	22	24	22	34	26
B	15	2	3	36	40	42	48	52	46

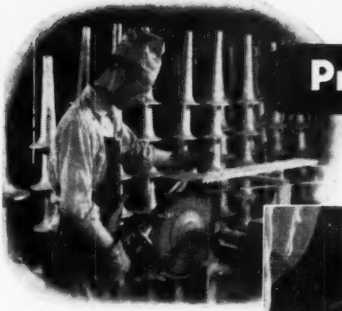
(Based on data presented at Atlantic City Meeting, American Chemical Society, 1949)

reacting the styrenated fatty acids with phthalic anhydride and glycerol. Table I gives the film properties of two finishes prepared by reacting styrenated dehydrated castor oil fatty acid with phthalic anhydride and glycerol. The results show the experimental styrenated alkyds to have excellent air drying and baking characteristics. Additional tests were conducted which showed that the styrenated alkyds are faster drying than conventional short oil alkyds or amino-alkyd resin mixtures; also, they were found to exhibit good overall film properties.

Also along this general line, P. O. Powers, Battelle Memorial Institute, discussed the addition of styrene to fatty acids. While recent work has shown quite clearly that styrene combines quite readily with the drying oils, it is important that the conditions employed, and the types of oil used, be controlled carefully if clear and homogeneous products are to be obtained.

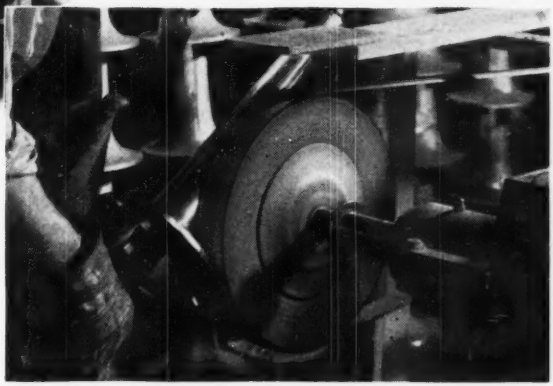
Experiments reported by Powers showed that styrene adds to oleic acid at 320-437 deg. F. to form addition products containing from 1 to 25 styrene segments per fatty acid molecule. Styrene adds to linseed and dehydrated castor oil acids at 320-437 deg. F. to form styrenated fatty acids. These acids contain from 1 to 25 molecules of styrene per fatty acid. At the higher temperatures of reaction, the acids formed are more soluble for a given acid number and require more non-solvent to effect precipitation. From the standpoint of mechanism of the reaction, it was pointed out that indications are that the non-conjugated acids act as chain enders in the polymerization of styrene. This behavior is consistent with the presence of but one fatty acid segment in each polymer chain. The addition of more than one styrene chain per fatty acid may be an explanation of the apparent lack of fatty acids containing two to eight styrene segments, since these, if found, may combine with other growing styrene chains to give more highly styrenated acids.

In a further discussion of the styrenation of products of the dehydration of castor oil, H. M. Hoogsteen and A. E. Young, Dow Chemical Company, and M. K. Smith, Baker Castor Oil Company, brought out the fact that although experience has indicated that valuable paint vehicles may be prepared by the styrenation of dehydrated castor oil, all dehydrated caster oils do not yield products of equal quality upon styrenation. Work has been reported to show that varying the type of dehydrated castor oil used may have an effect on the styrenation reaction. In one instance it was found that reduction in diene value or increase in hydroxyl value gives rise to extended reaction time and may cause opalescence in varnish or film. Also, it has been reported that bodied dehydrated castor oils yield styrenated products of



Production jumped 50%

on this contour finishing job



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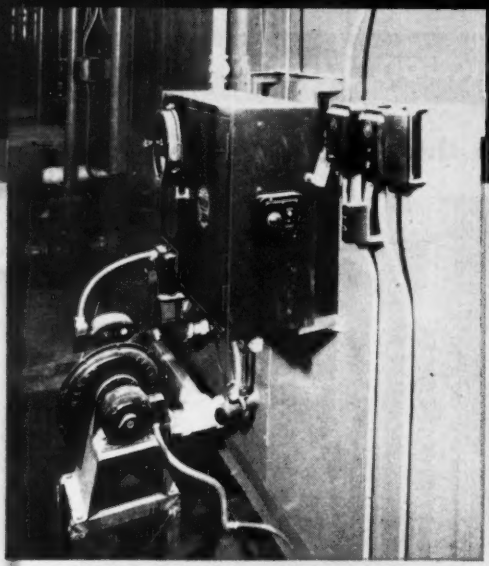
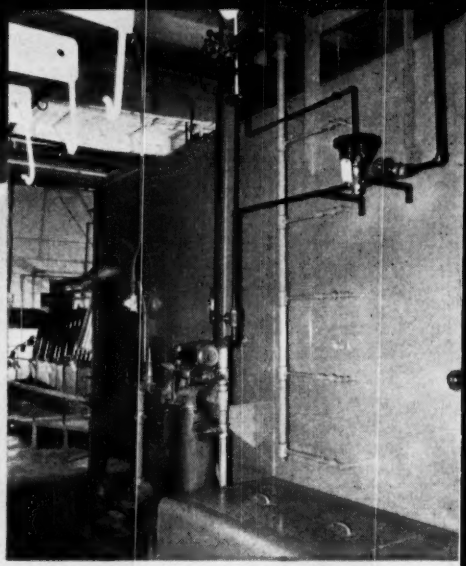
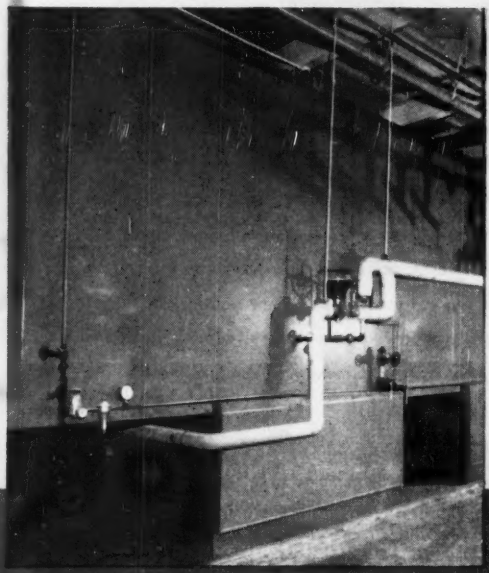


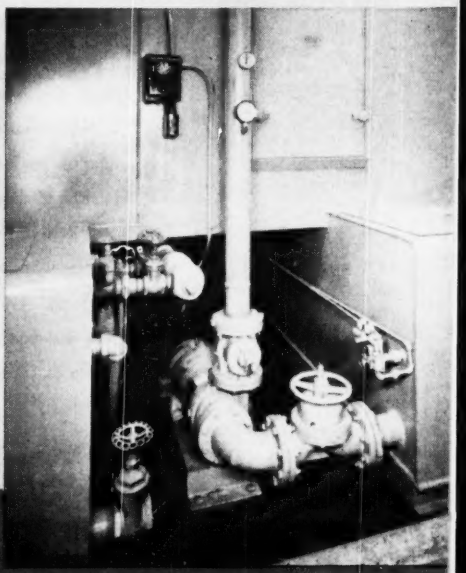
Dry-Off Oven Heating Unit and Automatic Temperature Controls, Recorder and Safety Devices. In many oven installations, combination Gas-Oil Fired Heating Units are employed—switch over from gas to oil firing may be accomplished in seconds without interrupting production.



Here is the paint pumping unit and temperature control equipment for the Flow Coating Machine. It includes, in addition to the pump, a Continuous Automatic Paint Filter and an automatic Paint Temperature Controller which maintains the paint at a constant temperature at the spray nozzles.



In the Five Stage Cleaning and Rust Proofing Machine steam coils provide heating element in each tank. Steam Supply Lines, Temperature Controls and Fresh Water Supply Lines are visible. Note the concrete curb on the floor, this surrounds the entire area occupied by the machine.



Pressure and Temperature Controls on [illegible] Stage [illegible] Cleaning Process. Air operated Temperature Con[illegible] and Thermostat are visible an end of tank. The [illegible] mometer, Pressure Gauge and Control Valve [illegible] located on main pressure line above pump. [illegible] water-tight access door in processing tunnel.

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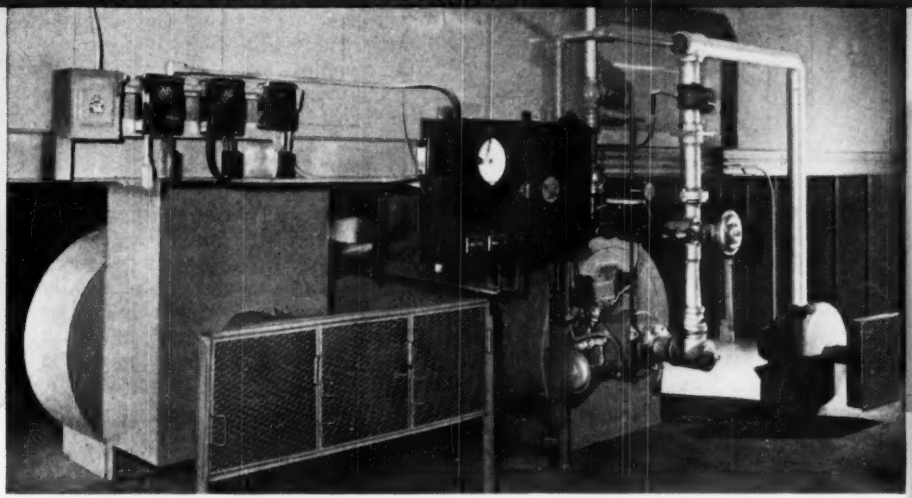

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Control of finish processing through each phase of the operation is now a must with manufacturers who demand a fine durable finish for their products. Illustrated here are Mahon automatic control devices applied to a complete finishing system recently installed for Houdaille-Hershey Corporation . . . each phase of the finishing process is controlled automatically within temperature and pressure limits which assures maximum results from materials employed. The heating unit, fresh air supply, temperature controls, recorder and safety devices for operation of the finish baking oven are grouped above. Years of development and experimentation have brought these automatic control devices to a degree of perfection that consistently produces finest finishing results, and, at the same time, holds production costs to an irreducible minimum. These are points to remember when comparing initial costs of finishing equipment. Remember, also, that Mahon has pioneered development in this highly specialized field for thirty years—and that Mahon engineers have, through constant research and experimentation, accumulated a wealth of technical knowledge and practical know-how not available to you elsewhere. See Mahon's Insert in Sweet's Mech. Ind. File, or write for Catalog A-649.

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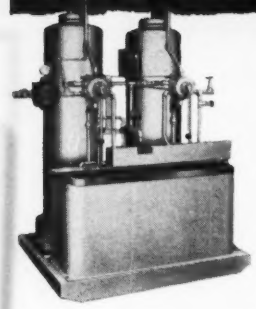

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The operation is very simple. Raw water is passed through alternate beds of ion-exchange resins, and it comes out free of all mineral salts. No steam, heat, still, or cooling water is needed—keeping space requirements at a minimum.

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improved water resistance as compared with styrenated raw oils.

Several points of importance to protective coating technology were brought out by this most recent work on styrenation of various types of dehydrated castor oil. First, the hardness of the end product is greater, the greater the viscosity of the original oil. Also, there is a definite trend towards products of greater speed of dry when using oils of higher viscosity in the styrenation reaction. Tests conducted during this work showed that these styrenated products that did not become hazy during the water immersion test were all derived from oils of the higher viscosity range. A further conclusion reached was that the most desirable products are obtained by styrenating castor oil that has been dehydrated to a minimum hydroxyl content, and then has been bodied to a viscosity approaching 15 poises.

* * *

Acid Dips for High Carbon and Low Carbon Steel Prior to Electroplating

ONE OF the features of the 36th annual convention of the American Electroplaters' Society was a round table discussion on acid dips in cleaning cycles prior to electroplating. Of particular interest were the facts brought out with reference to plating on high carbon steel as compared with low carbon steel. In discussing plating on high carbon steel, Dr. R. M. Wick, Bethlehem Steel Company, brought out the fact that particular attention must be paid to the processing steps because of two prevailing conditions that are not evidenced in plating on low carbon steel; namely, the tendency toward embrittlement, and the requirements for obtaining adhesion of the electroplate.

According to Dr. Wick, the tendency

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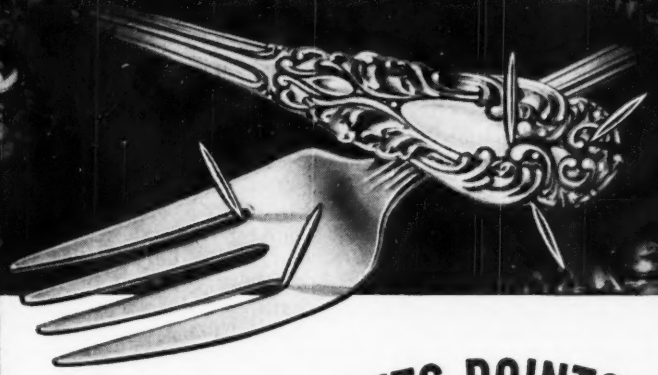

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towards embrittlement of high carbon steel, as a result of processing steps, seems to increase with the hardness of the steel at the time of plating. The maximum hardness found in practice ranged from C45-C48 for springs, and up to C57-C62 for parts that are to be chromium plated for engineering use. A useful viewpoint in considering this problem concerns the precautions to be employed in order to obtain a successful result. Avoidance of over-hardening in the previous treatment of the parts is essential. Heat treatment conducted so as to obtain a clean and scale free surface is desirable. Mechanical methods for preliminary treatment of hardened parts prior to plating may be relied upon to give satisfactory results in many instances.

Dr. Wick brought out the point that cathodic cleaning is not always entirely free of some risk of hydrogen embrittlement. In any case it is a good policy to hold the electrolytic cleaning to a minimum by means of suitable pre-cleaning operations, such as degreasing or alkali soak cleaning. In pickling hardened steel parts prior to electroplating, it has been recommended that sulfuric acid not be used; hydrochloric acid is preferred, and it is advisable that the treatment should be held to a minimum. If for any reason there is smut left on the surface from the pickling treatment, it should be removed by electrolytic anodic alkaline cleaning or with cyanides.

A number of anodic etching treatments have been used to give adhesion in the degree that is necessary on many types of high carbon steel parts. Anodic treatment in sulfuric acid, within a concentration range of 250-1000 gm./l., at a temperature preferably above 77 deg. F. and not exceeding 86 deg. F., is commonly used. The time of treatment usually does not exceed one minute at a current density in the range of 100-400

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- **GUARANTEE** — Backed by Robinson's 71 years of experience and integrity in precious metals.

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amp./sq.ft. One etching procedure consists of a short dip in nitric acid solution, followed by an anodic treatment in cyanide solution.

In general, the electroplating procedures for plating on high carbon steel are not specialized. However, coatings with low internal stress are generally most desirable. Springs should not be plated while subject to externally applied stress. Heat treatment of plated high carbon steel parts is generally directed toward minimization of the effect of embrittlement. Treatments recommended vary in time from 1-5 hours, and in temperature from 300-500 deg. F., but usually average about 400 deg. Fahrenheit.

In discussing pickling treatments for low carbon steels prior to plating, as a part of the round table discussion, I. C. Hepfer, Furniture City Plating Company, Grand Rapids, stated that, in general, hydrochloric acid will give the best results for the greatest variety of conditions. Sulfuric acid is sometimes preferred because of the lower cost, but hydrochloric acid has the ability to dissolve rust and scale much more readily, having a much quicker action for a given concentration and temperature. Some of these results may be due to the fact that ferrous chloride is much more soluble than ferrous sulfate. Hepfer also pointed out that hydrochloric acid gives a more free rinsing, smut-free, and brighter finish than does sulfuric acid; also, it will tolerate, without detrimental effects, a much larger amount of dissolved iron than will sulfuric. One disadvantage of the use of hydrochloric acid pickling was based on its volatility, resulting in the corrosion of equipment in the plating room and making the use of high pickling temperatures wasteful.

In some cases, hydrofluoric acid is added to either hydrochloric or sulfuric acid pickles to remove molding sand from cast iron, or sand from the surfaces of sandblasted steel. Nitric acid in small quantities has been used with sulfuric acid to aid in the removal of oxides that could not be satisfactorily removed with the sulfuric acid alone.

As a rule, according to Hepfer, most acid dips for light rust or scale removal are used at room temperature, whereas if heavy scale must be removed, elevated temperatures are recommended. In this latter application, sulfuric acid pickle baths are sometimes operated in the temperature range of 150-190 deg. F. Increasing the temperature increases the speed of pickling; it was stated that the action of the pickle bath doubles in speed with every 14-17 deg. F. increase in temperature. In the case of heavy pickling for scale removal, inhibitors are usually added to the bath. Generally, it is considered that there is little need for using an inhibitor when pickling parts prior to plating. In this case the acid dip is for so short a time that there is little

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Klem-Kote cleans, conditions, rust-proofs, in one operation . . . eliminates extra stages . . . saves time, material, heat, labor. Here's a typical spray washer process, using Klem-Kote in *ordinary steel equipment:*

1. Klem-Kote at 1½ oz. per gal. water; temperature 170° to 180°F.; time, 1 minute. **2.** Rinse. **3.** (Optional) Hot Rinse.

Simple . . . but effective . . . with non-toxic, non-fuming Klem-Kote leaving a fine, iridescent, crystalline, tightly-adherent, *complex* phosphate coating—a perfect paint bond! Eliminate complicated, costly, six-stage or inadequate three-stage systems you may now be using. Let Klem-Kote help you save, reduce rejects and improve the finish of your products.

There is a Klem Field Service Engineer in your area. Write now for complete information on how Klem-Kote can solve your particular finishing problem quickly . . . and economically.

Klem-Kote is equally effective on steel, iron or aluminum surfaces, suitable for immersion or spray process. Shipped in 100 lb. or 400 lb. drums.

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chance for acid attack and there is some danger that the inhibitor will not be completely rinsed from the surface of the metal and will prevent good adhesion of the subsequent electroplate. Various types of electrolytic pickles have been used as substitutes for ordinary acid dipping prior to plating. As a rule, anodic electrolytic pickling is generally preferred because it does not cause any tendency towards hydrogen embrittlement.

* * *

Lacquer-Type Cellulose Acetate Butyrates

IT has recently been pointed out by Carl J. Malm and Harold L. Smith, Jr., Eastman Kodak Company, that there is now commercially available a series of low viscosity cellulose acetate butyrates covering a wide range of those properties which make them suitable for use in formulation of lacquer finishes. The cellulose ester which has heretofore found most general use as a film forming agent in commercial lacquers is cellulose nitrate. As recognized by most finishing technologists, it has many excellent properties for this use and has gained wide acceptance in the field. However, as brought out by Malm and Smith, it has two disadvantages, flammability and a tendency to yellow and deteriorate on aging.

The organic acid esters of cellulose offer considerable improvement in these two properties. However, the cellulose esters in this class which were first commercially available (cellulose acetate and later, low butyral acetate butyrate) suffered from limited solubilities and poor compatibilities with plasticizers and resins. The new type esters, with higher butyral contents, show much improved solubilities and compatibilities and are, thus, suitable for use in lacquers. It was reported that they have many of the good properties of the well-

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Fidelity SP-14 Protective Strippable Coating has a neutral pH. It will not affect color or any type of coating on which it is used.

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Says Darnell Corp., Ltd.,
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Casters and industrial rollers made by Darnell Corporation are plated by this Udylite Junior Full Automatic unit to give them longer life and lasting finish.

A YEAR AGO the Darnell Corporation, Ltd., Long Beach, California, faced a bottleneck in their plating department. Barrels of steel parts were stacked up, waiting to be plated. Since installing a Udylite Junior Full Automatic, they are able to keep up with production by operating the machine only part time. In addition, parts are now thoroughly cleaned, pickled and, after plating, given a dichromate dip to improve paint adhesion.

Like many other platers they have found their Udylite equipment and plating processes improve both the quality and the quantity of production and reduce direct labor costs.

Udylite offers a complete line of plating and metal finishing equipment for all plants. Trained engineers are available at all times for consultation with you concerning your plating problems. Call in your Udylite Technical Man today. No obligation.

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Table II

Composition of Commercial Lacquer-Type Cellulose Acetate Butyrates

	AB-161-2	AB-272-3	AB-381-1	AB-500-1
Acetyl, %	31.0	20.5	13.0	6.5
Butyryl, %	16.0	26.5	37.0	48.0
Hydroxyl, %	1.0	2.5	2.0	0.5
No. of groups per C_6 unit				
Acetyl	2.18	1.45	1.00	0.54
Bytyryl	0.67	1.11	1.67	2.40
Hydroxyl	0.15	0.44	0.33	0.06

Table III

Physical Properties of Some Lacquer-Type Cellulose Esters

Type	AB-161-2	AB-272-3	AB-381-1	AB-500-1	A-48, Cellulose Acetate	0.5-Sec. RS-type Nitrocellulose
Melting point, ° C.	250	205	180	165	235	dec.
Density, g./cc.	1.25	1.23	1.21	1.18	1.31	1.59
Moisture regain, %						
25% RH	0.8	0.9	0.6	0.4	1.6	0.8
50% RH	1.7	1.8	1.1	0.6	3.5	1.8
75% RH	2.8	3.3	1.8	1.1	6.3	2.7
95% RH	4.4	6.0	3.0	2.0	12.5	5.1

known RS-type nitrocellulose, are less flammable, and have good color retention and stability on aging.

Many properties of these cellulose acetate butyrates may be varied by changing the total amount of acetyl and of the ratio of acetyl to butyryl in the ester. Table II as prepared by Malm and Smith for the report which appeared in a recent issue of "Industrial and Engineering Chemistry" gives the commercial identification of those esters now on the market together with their composition both in per cent acetyl, butyryl, and hydroxyl, and an average number of these groups per anhydroglucose unit of cellulose. There may be considerable differences in the various physical properties as a result of these variations in chemical composition. The particular values for typical batches of the low viscosity lac-type cellulose acetate butyrates are given in Table III. This table shows variation in properties with change in composition and also gives, for comparison, values for lacquer-type cellulose acetate (A-48) and 0.5 second RS-type nitrocellulose.

In the series of cellulose acetate butyrates, as the amount of butyryl is increased and acetyl decreased, there is a gradual lowering of the melting point and a decrease in density. Comparing these values, it should be noted that the densities of all the cellulose acetate butyrates are appreciably lower than that of cellulose nitrate, thus affording about 30 per cent greater film coverage from a given weight of ester. Also, the moisture regain values are much lower than for cellulose acetate, indicating much better dimensional stability and better weathering qualities.

In further discussion of the prop-

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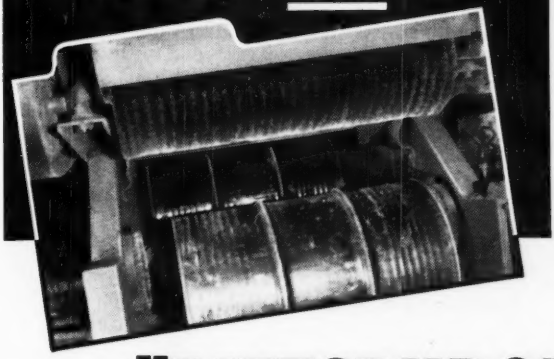

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Table IV

Trends in Compatibility of Synthetic Resins With Lacquer-Type Cellulose Acetate Butyrates

Type of Resin	AB-161-2	AB-272-3	AB-381-1	AB-500-1
Alkyds, Phenolics, Ureas, Maleics, Polyesters	Compatibility depends on modifiers used in resins. Many resins of these types designed for lacquer use are compatible, particularly with type AB-381-1 ester			
Aryl sulfonamide- formaldehyde condensates, Modified hydrocarbons	← Compatibility very good →			
Chlorinated biphenyls	← Good →		← Very good →	
Acrylates	Fair	Good	Very good	Fair
Rosin derivatives	← Fair →		← Generally good →	
Polyvinyl acetates	Fair	Very good	Good	Poor
Polyvinyl chlorides, Polyvinyl chloride-acetates, Polyvinyl acetals	← Generally not compatible →			
Unmodified hydrocarbons, Melamines, Furfurals	← Generally not compatible →			
Alkyd resin plasticizers	Fair	← Generally good →		

erties of the new lacquer-type esters, Malm and Smith brought out the fact that hardness values for films formed from unplasticized cellulose acetate butyrates, as measured by the Sward rocker, are slightly less, of the order of 5-10 per cent, than those found for films of the 0.5-second nitrocellulose coated under comparable conditions. Another point is that hardness tends to decrease slightly as the butyryl content of the ester is increased. However, it should be kept in mind that the actual magnitudes of the hardness values as well as values for properties such as tensile strength, elongation, and flexibility are very markedly affected by the solvents used and the coating conditions employed and are subject to wide variation by the inclusion of modifying resins and plasticizers. As a general rule the compatibility and solubility of the materials improve as the amount of butyryl group in the ester is increased.

According to data presented by Malm and Smith, no definite rule can be formulated for predicting the compatibility of the cellulose acetate butyrates with synthetic resins in films coated from solvents. For any particular resin, the best policy to follow is to test its compatibility under specific use conditions to determine its characteristics. In view of the fact that compatibility is considerably affected by the solvent combination used and the type and amount of plasticizer present, actual use tests are doubly important. However, some general trends can be pointed out, and these are given in Table IV which lists the main types of synthetic resins with general comments on their compatibility with the commercial cellulose acetate butyrates.

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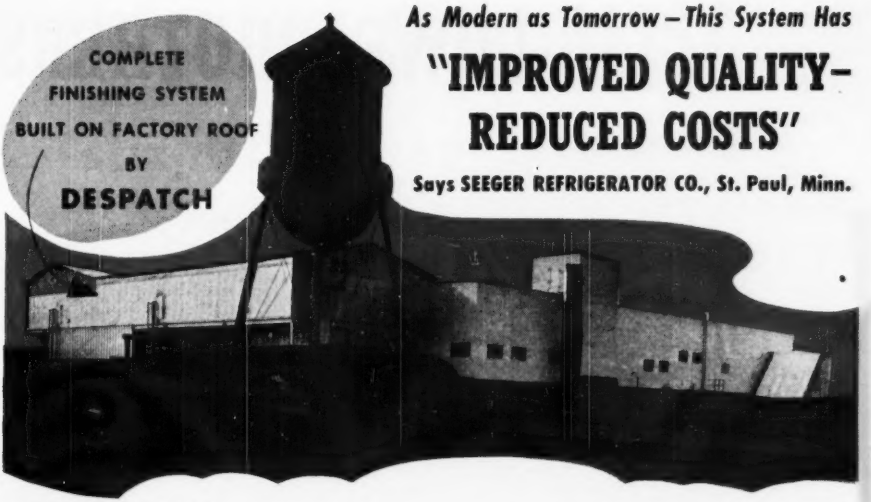

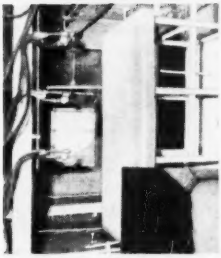

Specially built Despatch uniform air velocity booth. Inset shows split curtain.

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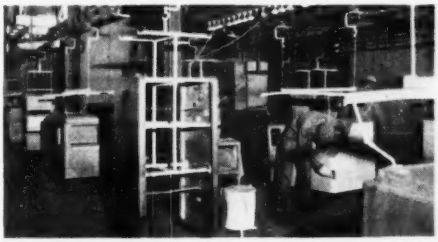

General view of the prime coat sanding area.

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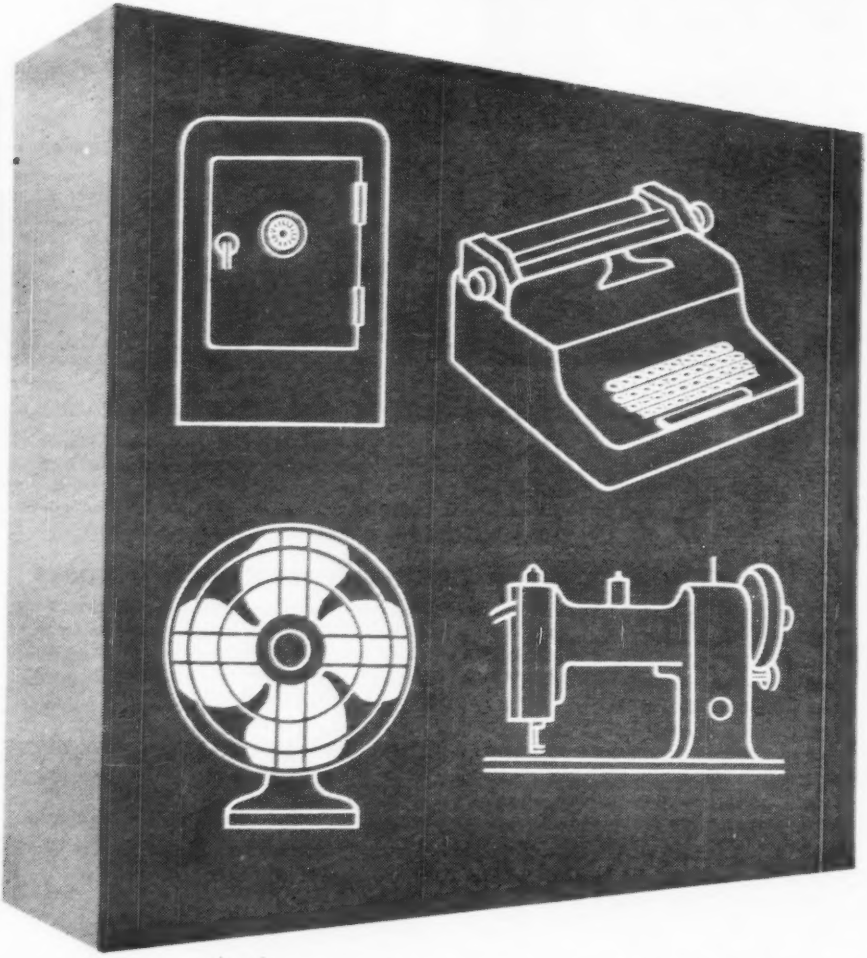

✻ In this case, Lowe Brothers made two finishes to meet the manufacturer's requirements. Lowe Brothers Wrinkle Finishes and Enamels are being used today on a broad range of products from typewriters and safes to fans and sewing machines. Whatever *your* product, a quality-made Lowe Brothers Industrial Finish is your full assurance of *efficient* production and *excellent* finishing results.

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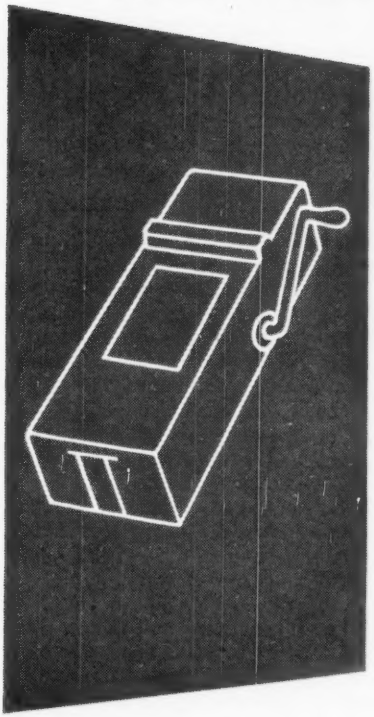

This advertisement is based on facts from the Lowe Brothers Industrial Case History Files.

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In general, data presented on the new lacquer-type esters show that each has its own field where it is most suitable. Types AB-272-3 and AB-381-1 (refer to Tables II and III) are the most suitable. They both have generally good solubility in a wide variety of solvents and fairly wide compatibility with plasticizers and resins. Films based on these esters are basically much less flammable than nitrocellulose, have good weather resistant qualities, clarity, and color stability. It was pointed out that Type AB-500-1 is by itself rather low melting and somewhat soft for many lacquer uses but offers interesting properties where solubility in the less polar solvents or a minimum susceptibility to water is desired. The higher viscosity types are to be preferred where film strength and flexibility are of major importance and where appreciably lower solids contents or high solution viscosities can be tolerated in application. In general, these types of cellulose acetate butyrates offer definite new possibilities in the formulation of lacquer-type protective coatings.

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* * *

Progress In Electroplating Uncommon Metals and Alloys

SEVERAL reports were given at the Electrodeposition Symposium, held as a part of the 96th meeting of the Electrochemical Society in Chicago, which indicated that progress is being made in electroplating some of the metals and alloys which are hard to plate. Based on work conducted at the University of Wisconsin, H. J. Seim and M. L. Holt described a new aqueous citrate bath for the electrodeposition of alloys of molybdenum with cobalt, iron, and nickel. This type of plating solution contains the sulfate of the co-depositing metal, citric acid, and sodium molybdate. The highest percentage of molybdenum, around 50 per cent and more, was obtained with iron as the co-depositing metal, and the lowest with nickel.

The bath recommended for plating cobalt-molybdenum alloys contained 60 gm./l. cobalt sulfate, 66 gm./l. citric acid, and amounts of sodium molybdate going up as high as 40 gm./l. It was pointed out that the cathode current efficiency and the percentage of molybdenum in the deposit increase as the amount of sodium molybdate in the bath is increased; however, the cathode current efficiency decreases as the cathode current density is increased. At pH values of 3 and 4, test plates made with the Hull Cell were uniformly bright at sodium molybdate concentrations as high as 40 grams per liter.

A bath described by Seim and Holt as satisfactory for plating nickel-molybdenum alloys consists of 60 gm./l. nickel sulfate, 66 gm./l. citric acid, and 4 gm./l. sodium molybdate. A

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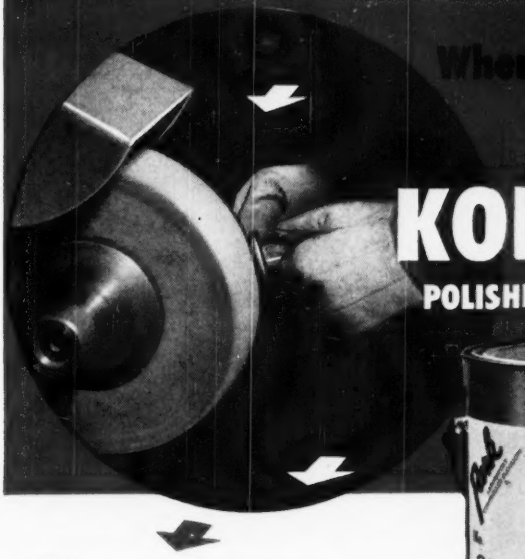

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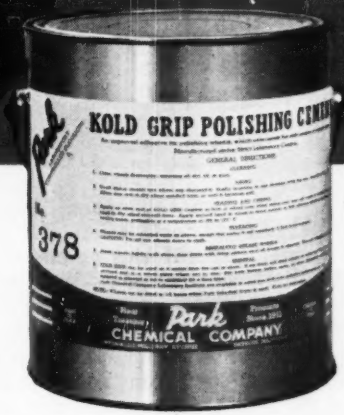

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Table V

The Effect of Cathode Current Density on Plating Nickel-Molybdenum Alloys. pH 4.0—Temperature 77 deg F.

Conc. of Na_2MoO_4	Current Density amp/dm²	Time min.	Wt. of deposit	Analysis		Cathode Efficiency %	Character of deposit
				% Mo	% Ni		
(g/l)			(g)				
0	5.0	10	0.0387	—	100.0	22.9	dull
0	10.0	5	0.0311	—	100.0	17.1	dull
0	22.2	3	0.0389	—	100.0	16.1	gray
4	1.0	20	0.0040	23(?)	85(?)	7.1	tarnished
4	2.0	20	0.0398	19.7	79.7	35.0	bright
4	5.0	10	0.0469	16.9	83.2	31.9	bright
4	10.0	5	0.0390	13.0	87.7	24.2	bright
4	15.0	3	0.0362	11.6	86.4	25.5	dull
4	22.2	3	0.0521	10.8	88.2	24.8	dull
8	2.0	20	0.0121	27.3	72.7	9.3	stained
8	5.0	10	0.0412	23.8	75.1	29.8	bright
8	10.0	5	0.0443	18.5	80.4	27.0	milky
8	15.0	3	0.0336	14.2	84.8	23.2	milky
8	22.2	3	0.0438	10.3	88.7	20.1	milky
12	10.0	10	0.0650	27.4	71.7	22.5	slightly darkened
12	22.2	3	0.0440	17.2	81.3	20.8	bright

(Based on data presented at 96th meeting, Electrochemical Society)

bath pH of 4 was recommended; Table V gives results of tests conducted in the Wisconsin laboratories on the effect of cathode current density on the operating characteristics of the nickel-molybdenum bath.

The best iron-molybdenum alloy plates were obtained from a bath containing 60 gm./l. ferrous sulfate, 66 gm./l. citric acid and 4 gm./l. sodium molybdate, operated at pH 6. Table VI shows the effect of cathode current density and sodium molybdate concentration on the results obtained from the iron-molybdenum plating bath. Of interest is the fact that Seim and Holt reported, in the course of their discussion on these binary alloy systems, that recent work in their laboratory has shown that ternary alloys containing tungsten, molybdenum, and a co-depositing metal can be plated from a citrate type of plating bath.

Plating Pure Molybdenum

Experiments were reported by L. F. Yntema, Fansteel Metallurgical Corp., which showed that metallic molybdenum can be electrodeposited from aqueous solutions of molybdic acid containing high concentrations of salts. The report, based on work conducted at St. Louis University in conjunction with Sister M. J. Ksycki, cited formates, acetates, propionates, fluorides, and phosphates of sodium, potassium, and ammonium as being satisfactory for use. The optimum pH range for operation of the baths as measured with a glass electrode was stated to be 5.5 to 6.8. The current density range given was between 0.06 and 3.3 amp./sq. cm., while the temperature could be varied between 86-122 deg. F. Deposits were obtained on copper, nickel and iron cathodes, using platinum or carbon anodes.

It was reported that the deposits were characterized by excellent adherence to the base metal. The physical appearance of deposits of approximately 0.001 mm. thickness is that of

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Table VI

The Effect of Cathode Current Density and Molybdate Concentration on Plating Iron-Molybdenum Alloys pH 6.0—Temperature 77 deg. F.

Conc. of Na_2MoO_4	Current Density amp/dm²	Time min.	Wt. of deposit	Analysis		Cathode Efficiency %	Character of deposit
				% Mo	% Fe		
(g/l)			(g)				
4	5.0	20	0.0429	53.0	42.9	18.4	bright
4	10.0	10	0.0431	48.6	49.5	17.1	bright
4	15.0	7	0.0415	51.1	44.4	15.9	bright
4	22.2	4	0.0379	48.6	48.3	14.7	bright
12	10.0	15	0.0244	56.6	38.3	6.7	stained
12	22.2	5	0.0342	58.5	36.5	12.9	bright
20	22.2	5	0.0267	58.9	34.3	9.7	stained

a smooth white metal with a high luster; thicker deposits have a duller appearance, particularly around the edges of the cathode where the current density is higher. It was pointed out that of all the factors involved in the deposition of molybdenum, the mole ratio of anion to water appears to be the most important. The limiting ratios for the electrolytes were given as follows:

$$\frac{H_2O}{\text{formate}} \text{ equals 1.6 to 2.0}$$

$$\frac{H_2O}{\text{acetate}} \text{ equals 1.8 to 3.5}$$

$$\frac{H_2O}{\text{fluoride}} \text{ equals 3.6 to 6.6}$$

$$\frac{H_2O}{\text{propionate}} \text{ equals 1.6}$$

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Plating Chromium-Tungsten Alloys

D. G. Rogers and A. A. Burr, Rensselaer Polytechnic Institute, reported before the Electrochemical Society meeting that thin bright plates of chromium-tungsten alloy, containing up to about 40 per cent tungsten can be deposited from chromic acid solutions reduced with an organic salt to a trivalent chromium content of 30 to 50 per cent and made alkaline to a pH of approximately 8. Plates of 0.0001 inch thickness were deposited and they were reported to have remarkable resistance to attack by corrosive media.

Solutions 2 Molar in chromic acid were found to be most satisfactory for use. In the preparation of the plating bath, the chromic acid solution is heat-

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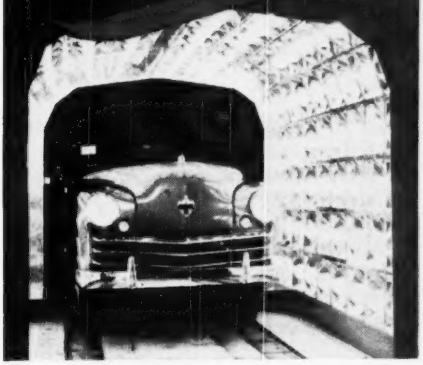
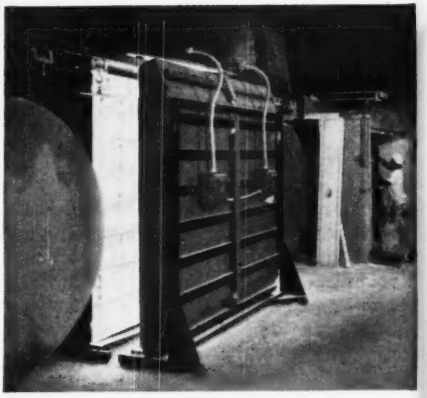


Crosley Motors uses Fostoria Evenray to dry colored touch-up lacquer on finished cars on the repair line. Drying time is 1¾ minutes. 32 KW oven with 275 watt lamps.



General Porcelain Enameling & Mfg. Co., Chicago, remove moisture from frit on metal signs with Fostoria Evenray. Completely dried in 12 minutes. Oven is 7'4" long, equipped with 500 watt lamps.

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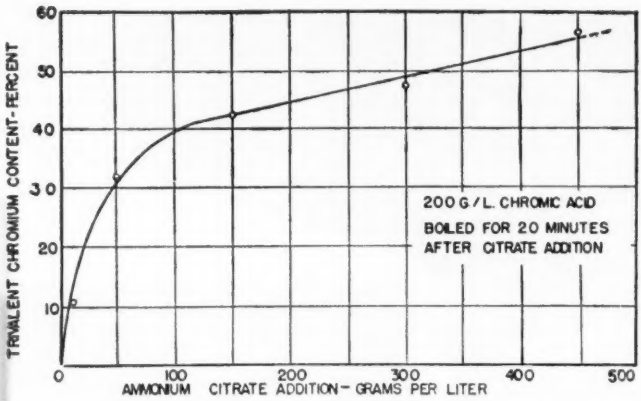

Fig. 1 — Amount of chromium reduced to the trivalent state by additions of ammonium citrate to 2 molar chromic acid in the preparation of a chromium-tungsten alloy plating bath (*Based on data presented at the 96th Meeting of Electrochemical Society*)

ed nearly to its boiling point and an organic reducing salt added slowly to it. After the addition of the organic salt is completed, the solution is boiled for about 20 minutes so that the reaction between the reducing ion and the hexavalent chromium will go nearly to completion. The requisites of a suitable organic substance appear to be that it reduce the hexavalent chromium to the trivalent state, and that no foreign metal ion be added to the solution. It was pointed out that only a few of the many possible organic compounds were investigated, with ammonium citrate being by far the most satisfactory. The amount added does not seem to be highly critical, as long as the percentage of trivalent chromium in the solution is between 30 and 50 per cent. Figure I shows the relationship between the weight of citrate added to 2 Molar chromic acid and the percentage of chromium reduced to the trivalent state. In general, citrate additions of 300 gm./l. were found to be the most satisfactory.

Following this procedure 100 gm./l. of tungstic acid should be added and the pH adjusted to 8 with ammonium hydroxide. A temperature of 158 deg. F. and a high current density, going up as high as 13 amp./sq. in. were recommended for operation. The cathode efficiency was described as poor. The deposits produced, it was stated, will usually contain 32-33 per cent tungsten, and tests over a period of 15 hours' immersion have shown the plates to be practically unattacked by any of the four common inorganic acids (HCl, HNO_3, H_2SO4, HF) or any combination of them. Examined microscopically, the alloy plates were reported to be

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quite free of cracks, and to possess excellent adherence to the base metal. The experimenters stated that steel cathodes were plated with the alloy and submerged in saturated sodium chloride solution for several days. The extremely thin alloy plates were found to give protection against corrosion comparable to that provided by pure chromium plate 10 times as thick.

Bismuth Plating

Also included in the Chicago Electrodeposition Symposium was a report by R. Scott Modjeska and S. P. Gary, Scientific Control Laboratories, on a study of the methods of electrodepositing bismuth from aqueous solutions for industrial applications. The perchlorate bath, with addition agents, gave the most satisfactory results. The deposits produced were described as close-grained and metallic white, with fair adhesion to the base metal. It was pointed out that the overall difficulty was not in depositing the metal, but in obtaining continuous, adherent, dense deposits.

Copper-Lead Plated Alloys

Continuing the discussions on plating at the Chicago Electrochemical Society meeting the results of tests carried out at the University of Michigan to develop a copper-lead plating system were reported by A. L. Ferguson and N. W. Hovey. The most promising bath was a cyanide-tartrate system; the alloy deposits were described as hard and brittle except those containing a high percentage of lead.

* * *

Determination of Traces of Zinc In Nickel Plating Baths

WORK conducted under American Electroplaters' Society Research Project No. 2, at Lehigh University, under the direction of Earl J. Serfass, has resulted in a new method for the determination of traces of zinc in electroplating baths. The method, which is based on a colorimetric technique, uses dithizone. In the procedure copper and iron are first removed by the formation of their cupferrides followed by extraction with amyl acetate. Heavy metals including nickel are then complexed with sodium dithiocarbamate. Zinc dithizonate is formed in the presence of these complexes when a carbon tetrachloride solution of dithizone is added. The zinc is determined colorimetrically by measuring the amount of incident light absorbed by the red zinc dithizonate in a colorimeter with a green filter. However, excess dithizone must be removed before colorimetric examination. A "high-spot" method was also worked out which may be used in estimation of the amount of zinc in the bath. Platers interested in a new way for determination of zinc impurities in nickel plating baths will be interested in looking into this new method developed by A.E.S. research.

HOLLAND SAYS:
DEBURRING WILL CUT GRINDING COSTS
Motor Driven Tilting Tumbling Barrels for cleaning, polishing, grinding, deburring, sanding, burnishing and various other applications.
Wide selection of metal finishing equipment on hand. Write for FREE folder "M."
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Branch Offices: DETROIT • LOS ANGELES • GRAND RAPIDS • PHILADELPHIA

Suggestion Improves Finishing Process

Redesigned Masking Form

A masking form used for spraying a camera part in the finishing department of Eastman Kodak Company's Camera Works was so constructed that it allowed paint to get between the side of the form and the side of the part being sprayed. Because of the nature of the finish which was sprayed, and the amount of finish which accumulated on the camera part, a costly cleaning operation subsequent to spraying had to be employed.

Edward Hammar suggested that the masking form be redesigned so that it fitted the part to be sprayed much more closely, with the result that the paint overspray would be reduced and the costly cleaning operation could be altered to a simple inexpensive hand wiping operation.

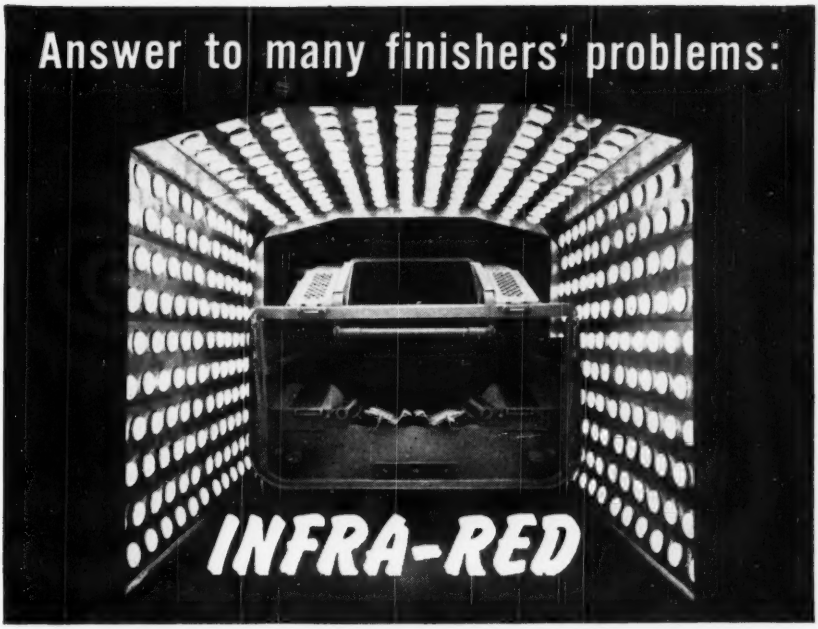
In the accompanying photograph, Mr. Hammar is shown examining the new form, the use of which has resulted in sufficient cost reduction to entitle him to an award of $700 from Eastman Kodak Company for his idea. The form previously used is shown at the left in the photograph.

This suggestion was submitted for publication in PRODUCTS FINISHING by William H. Zimmer, Secretary, Suggestion System, Eastman Kodak Company, Camera Works, Rochester 4, New York.

Send employee suggestions which have resulted in improved finishing processes (electroplating, lacquering, enameling, porcelain enameling, galvanizing, and so on) to PRODUCTS FINISHING. The suggestors will be paid for all suggestions accepted for publication.

PRODUCTS FINISHING 431 Main Street • Cincinnati 2, Ohio

Answer to many finishers' problems:



From actual service records, it's easy to see why infra-red is the choice of more and more product finishers. So many real problems are eliminated by this type of baking oven. It speeds up finishing. It cuts space requirements, costs less to install, allows quicker, better control of heat, wastes less of its output. And for years it has been piling up the evidence of substantial savings – savings in baking time, in costs of operation. It has proved it can supply a better bake; minimize rejects. So if you're looking to install or improve a baking cycle, chances are infra-red is *your* best bet too.

THE LAMPS MAKE A DIFFERENCE, TOO!

Amplex offers a complete line of infra-red bulbs for all types of ovens, each characterized by operation at point of greatest infra-red heating efficiency, by dependability, by long life.

What's more, they are the only lamps you can get with "Moisture-cote" protection – a treatment which affords remarkable resistance to lamp breakage by splashing, condensed moisture, paint drippings – at a cost only slightly more than ordinary lamps!

Want more information? Write us – Amplex Corporation, Dept. 54,119 Water Street, Brooklyn 1, New York.

amplex

manufacturers of industrial infra-red heat lamps • vibration service lamps • rough service shockproof lamps • sealed beam reflector lamps • reflector spotlights and floodlights • street lamps • traffic signal lamps.

FINISHES

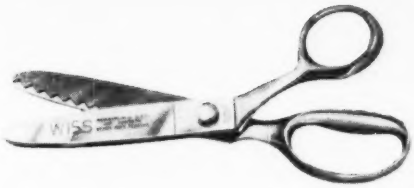
● St. Charles custom built steel kitchen units are finished with two coats of baked synthetic enamel in four pastel shades: "Sunny Yellow," "Shell Pink," "Mint Gray," and "Sea Green." Kitchens in color are becoming increasingly popular.

(Photo courtesy St. Charles Mfg. Co., St. Charles, Ill.)

● The Hupp Console Cup Cold Drink Machine is finished in two shades of baked enamel applied over phosphatized steel. Fittings and trim strips are chromium plated.

(Photo courtesy Globe Stamping Div., Hupp Corp., Cleveland 2, Ohio)

that aid in appearance and utility



● **Wiss Model E pinking shears are made with chromium plated metal alloy frames and inserted hardened flat steel blades.**

(Photo courtesy J. Wiss & Sons Co., Newark, N. J.)

● **The Chambers gas range, Model 90-C, is available finished in "Freedom Red," "Black Magic," white or pastel shades of blue, yellow, green, and gray porcelain enamel. The one-piece steel top is chromium plated as are the various handles and trim sections.**

Shown mounted in position above the Chambers range is a Vent-A-Hood exhaust unit, finished in special Interchemical Polymerin Synthetic Enamel, baked on Electro Paintlok Steel, with chrome trim and binding.

(PRODUCTS FINISHING Staff Photo)

PRACTICAL APPLICATIONS *of Modern Products*

More Rapid Paint Baking Accomplished in All-Metal Infra-Red Heater Installation

WHAT to do with a 100-foot infra-red oven that didn't deliver the goods fast enough was a metal awning manufacturer's problem that was effectively solved with all-metal Chromalox Electric Radiant Heaters.

Aluminum strips approximately seven inches wide and of varying lengths are roll-coated and passed through the oven. The original heat source was not intense enough; therefore, too slow to synchronize the drying with other production operations.

The highest temperature previously reached was 314 deg. F., which took 8½ minutes to dry the paint, while the paint supplier's specified minimum baking schedule was 6 minutes at 350 deg. Fahrenheit.

The infra-red heating problem was to meet the minimum paint drying schedule established by the paint supplier—the same schedule to which other operations were geared. To do it, four banks of radiant heaters, each containing four 3-kw., 230-volt, 6-foot heaters, were installed in the front 24 feet of the oven. For precise temperature control the heaters were connected to input controllers.

Zone 1, the first bank at the oven entrance, is operated at 100 per cent of capacity to produce a quick tem-

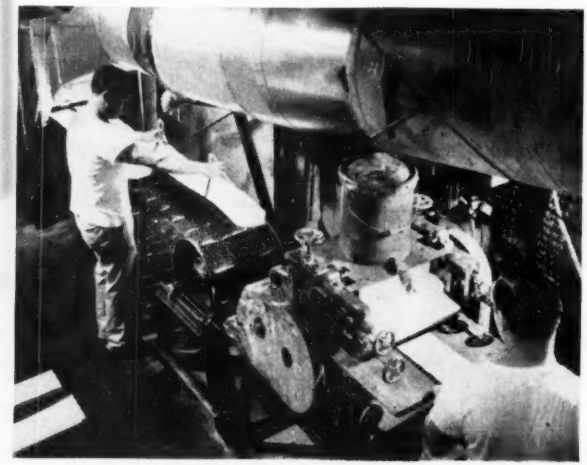


Fig. 1—Roll coating aluminum strips. Operator at left is placing the coated strips on the supports bolted to the woven wire conveyor belt which carries the strips through the infra-red oven for baking. Oven exhaust is shown at top of photo.

"Tests prove there's none better-- figures show it costs you least"

*Special trial order packaging

Exhaustive tests have proved that ARP #3 zinc plate brightener in barrel, still or automatic zinc plating gives you increased brightening range and a smooth, controllable, bright deposit of zinc second to none. The price of ARP #3 is well below that of any other zinc brightener of even satisfactory quality. The ease of handling and flexibility of operation reduce operating costs to make additional savings for you. For your own satisfaction, ask your Allied representative for full information and comparative cost breakdown . . . or, write for literature and 10 lb. trial order.

Use ARP #3 Plus IRIDITE® Bright For A *Lasting* Finish

For a lasting, brilliant and lustrous finish—combined with corrosion resistance—use Iridite Bright after bright zinc plating. This chromate-type finish requires only a simple dip—no heating, non-electrolytic—is efficient and inexpensive. Ask your Iridite representative.

ALLIED RESEARCH PRODUCTS, INC.
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Manufacturers of IRIDITE Finishes for Corrosion Resistance and Paint Systems for Non-Ferrous Metals: ARP Plating Chemicals

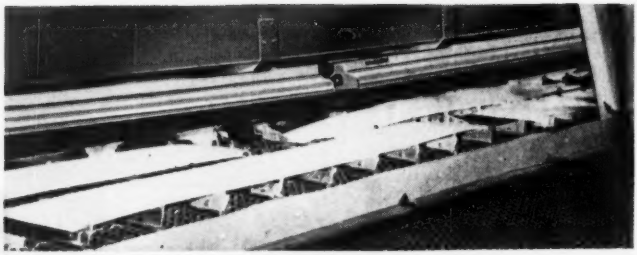


Fig. 2 — A cut-away view of the oven interior showing how the strips pass under the infra-red heating units during the process of paint baking.

Fig. 3—Minute input controller adjustments are made to ensure that the baking temperature cycle is correct for the color of paint being processed. The required temperatures are carefully charted, eliminating guesswork.

perature rise.

Zone 2 is an identical blank of four heaters but is controlled by a very accurate input controller adjusted to 80 per cent of heater capacity. The work is almost up to temperature and a slight reduction in the heat is necessary.

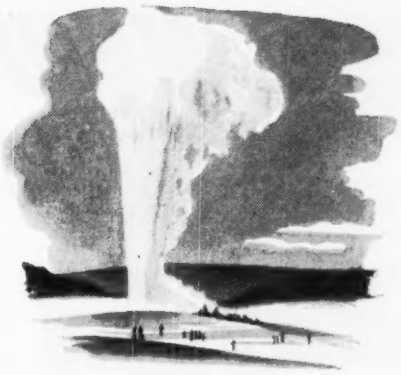
Zone 3 is two banks—eight heaters —decreased to 55 per cent of capacity by another input controller. The metal is now up to temperature and enters the holding zone to finish the baking.

Another advantage of this combination of radiant heaters and input controllers, pointed out by the manufacturer, the Edwin L. Weigand Co., 7552 Thomas Blvd., Pittsburgh 8, Pa., is the exact baking of all colors of paint. For different colors, predetermined and charted settings on the input controller are made for proper baking. The changes in the input controller settings are small, however, because all colors absorb the radiation almost equally well.

The installation of the units and their proper operation made it possible to secure a high quality finish in 29 per cent less time than was previously possible.

Fig. 4—Smoothly baked-on paint is ready to defy the elements in all climates. Racks in rear contain parts of various colors, ready for assembly.

Nature Shares a Cleaning Miracle with



AHCOLOID EMULSION CLEANER

For a quick miraculous cleaning, toss a soiled handkerchief into the hot bubbling springs of Yellowstone Park. You can depend on it, the waters will return it to you spotless and undamaged.

But dependable *speed, thoroughness,* and *safety in cleaning* is no monopoly of these natural earth-heated springs. In cleansing the oily surfaces of industrial metals, AHCOLOID EMULSION CLEANER works small cleaning "miracles" every day. Its routine job is the penetrating and loosening of clinging oils, enabling a quick water rinse to wash away the film. AHCOLOID EMULSION CLEANER is noncorrosive and gives off *no* malignant toxic fumes in operation — it is completely safe.

The special properties of AHCOLOID EMULSION CLEANER assure rapid, thorough, safe performance.

Send for a free copy of the booklet, "AHCOLOID EMULSION CLEANER", which explains in detail the properties and operation of this remarkable new cleansing agent.

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Please send me a free copy of your new booklet, "Ahcoloid Emulsion Cleaner".

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NEWS of the Industry

NEW PLANTS

The **SOUTH FLORIDA TEST SERVICE** of Miami, Florida, announces the acquisition of an additional city block for the expansion of its inland proving grounds and plans for the erection of a $25,000 laboratory building. The company will celebrate its 20th anniversary in 1951.

South Florida Test Service specializes in weathering, corrosion and sunlight tests utilizing the climatological conditions found only in subtropical southeastern Florida, but has laboratory facilities for many types of special research and test work.

The company maintains three locations in South Florida in addition to the main inland test field and laboratory in Miami. The locations at Miami Beach are for salt atmospheric tests and marine tests, such as tidewater and total immersion in the ocean. A warehouse is also maintained in Miami for storage tests on packaging of foods, metal parts, and so on.

COMPANIES

AMERICAN BRAKE SHOE COMPANY has announced the consolidation of all operations of its Canadian subsidiaries into one corporation, the Dominion Brake Shoe Company, Ltd., a wholly owned subsidiary. The operating assets and business of Joliette Steel Limited and Ramapo of Canada, Ltd. were acquired by Dominion Brake Shoe Company, Ltd.

With this consolidation, Dominion Brake Shoe will operate all of the Canadian plants of the parent company through five divisions. These operating divisions will be the Brake Shoe Division, Joliette Steel Division, Canadian Ramapo Division, American Brakeblok Division, and Kellogg Division.

Dominion Brake Shoe Company, Ltd. will make its principal office at 1405 Peel Street, Montreal, P. Q., Canada. It will continue to operate plants located at Lindsay, Niagara Falls and St. Thomas, in Ontario, and at Joliette, Quebec.

Products of Dominion Brake Shoe Company, Ltd. include brake shoes, track equipment, manganese steel castings, automotive brake lining, air compressors and paint spray equipment.

OAKITE PRODUCTS, INC., New York, manufacturer of specialized cleaning products, will feature recent additions to the line of metal cleaning and allied materials in Booth 565 at the Tool Engineers Exposition in Philadelphia, April 10-14.

In line with the show's "Cost-Cutting" theme, the exhibit will prominently feature Oakite Compound No. 33, a new, acid-type cleaner and surface-conditioner for ferrous metals and aluminum, as well as Oakite Composition No. 38, a recently-developed material which forms a dense foam-blanket on pickling solutions to prevent the escape of acid fumes. Other specialized materials highlighting this manufacturer's display will be: Oakite Composition No. 91 and 91-A which, when used together, are reported to provide improved electrocleaning of brass and copper; Oakite Composition No. 90, an electrocleaner for steel; Oakite Composition No. 97, an emulsifiable solvent for use in automatic washing machines to preclean steel, cast iron, brass, aluminum and zinc before electroplating or prepaint treatment or between processing operations; Oakite Pickle Control No. 3, a specially designed inhibitor for pickling solutions that prevents waste of acid after scale or rust is dissolved; Oakite

Compound No. 36, an acidic cleaner for tank-conditioning of metals for paint; and Oakite CrysCoat No. 87, for low-cost pre-paint conditioning of iron, steel, zinc, aluminum and copper alloys in mechanical washing machines.

The Oakite booth will be staffed by J. J. Basch, Philadelphia Division Manager, assisted by main office chemists, engineers and metal specialists from the company's field service organization.

An exhibit of more than 150 products made by nationally famous manufacturers and finished with Zapon products was featured at a two-day sales conference held at both the Stamford, Connecticut and North Chicago, Illinois branches of the **ATLAS POWDER COMPANY'S** Industrial Finishes Department.

North Chicago salesmen and sales engineers gathered at the Deerpath Inn, Lake Forest, Ill., for their meeting under the direction of Roy T. Riggs, sales manager. The Eastern sales force met at the Roger Smith Hotel, Stamford, for their sessions, which were in charge of sales manager W. G. Sheane. Isaac Fogg, Atlas president, F. S. Pollock, and W. G. Frome, vice presidents, and G. B. Work, general manager of the Industrial Finishes Department, attended both meetings.

The recently enlarged engineering and development department of **ALMCO SUPERSHEEN,** Albert Lea, Minnesota, has added a new service for the purpose of solving special barrel finishing problems for manufacturers. This special service, in most instances performed without charge, includes not only the special development of finishing procedure and technique but also special research and development on automatic handling, automatic separating, hoisting, and so on.

R. C. Trow, general manager of Almco SUPERSHEEN, in making this announcement stated that this service is available to all manufacturers. Letters of inquiry are invited and, wherever possible, the manufacturer is requested to outline his problems whether it be finishing, handling or separating. In the event it is necessary, Almco will place a qualified engineer at the disposal of the manufacturer for an on-the-spot analysis of the problem.

This is another step in Almco's expanding service for "A Better Finish Faster."

Appointment of The Udylite Corporation, Detroit, as national distributor for Rotary Tank Magnetools has been announced by **MULTIFINISH MANUFACTURING CO.,** 2114 Monroe Ave., Dept. 491, Detroit 7, Mich., the manufacturer.

As a feature of Udylite's initial sales program for these products, the D-Series Tank Magnetools, with a number of improvements, will be offered to the trade.

Series D Tank Magnetool in use

They may be obtained from any Udylite sales outlet, and also from plating supply companies which stock Udylite supplies and equipment.

THE NEW YORK BLOWER CO., Chicago, Ill., has announced the appointment of Gray Equipment Sales Co., 3219 Cheltenham Rd., Toledo, Ohio, and Air Purification Co., 1863 Wazee St., Denver 2, Colo., as its representatives in those areas.

THE PROZITE COMPANY, a recently formed Michigan corporation, has announced that Gerity-Michigan Corporation, Adrian, Michigan, has been appointed exclusive national sales agent for its

G. S. Scott (left), A. L. Pietrowicz

new line of buffing and polishing compositions. James Gerity, Jr., president of Gerity-Michigan, has announced that **G. S. SCOTT,** vice president, will be in charge of The Prozite Division. The new products, incorporating an entirely new abrasive material to replace tripoli, include Prozite bars and liquids for buffing operations, Pro-Brite lime finishes, Pro-Lube lubricant stick for abrasive coated polishing wheels and belts, and Prozite emery cake.

The Prozite Company is jointly owned by Poor & Company of Chicago and Calumet and Hecla Consolidated Copper Company, Calumet, Michigan. **A. L. PIETROWICZ,** formerly vice president of Chicago Plating Company, and a member of the American Electroplaters' Society, the Electrochemical Society, and the National Association of Corrosion Engineers, has been appointed sales manager for The Prozite Company.

Prozite products are manufactured in Calumet, Michigan, where the source of the new abrasive deposits is located. Research laboratories are in Waukegan, Illinois. It has been reported by Mr. Pietrowicz that in order to make use of the new Prozite abrasive material an entirely new line of activated bases and lubricants has been developed for Prozite compositions. These new components are claimed to have unusually high emulsifying and saponifying characteristics which result in greatly improved cleanability. Due to certain processing methods the abrasive material itself has been produced in extremely fine particle sizes, thereby providing an extremely large number of cutting edges and a very large abrasive surface in a given volume of the material. This is claimed to provide fast-

A Strippable Plastic for the Protection of Metals

Striplastic is a protective plastic applied by spraying, dipping or rolling. It is used on stainless steels, high polished metal sheets, sheets in cold working or drawing, tools, dies and parts, and on sheets or metal parts before packaging. It protects against scratching and abrasion, and against rust. Also available as a booth coat protection.

THE STRIPLASTIC COMPANY

Among many advantages, it is non-toxic, possesses great tensile strength and is easily stripped off in one piece. Write for complete information on this new strippable plastic.

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er cut and more mileage. The Prozite line is reported to be complete, incorporating compositions for buffing non-ferrous metals including die castings, stainless and carbon steel, precious metals, plastics, and rubber.

NEW POSITIONS

Allied Finishing Specialties Co., Chicago 12, Ill., has appointed **JAMES C. NEYLON** as Cleveland sales representative and **H. D. BRAITBERG** to the Chicago sales staff.

Mr. Neylon is a graduate of Harvard University and has had a great deal of experience with industrial finishes. He formerly was employed as head of technical sales service for finishes with a large chemical company in Ohio.

A graduate of the Illinois Institute of Technology, Mr. Braitberg has worked as a development chemist on paints and lacquers for the past six years.

At a recent meeting in Detroit, the directors of Lincoln Park Industries, Inc., elected **GENE DeMAMBRO** president of the corporation, which includes in addition to the Lincoln Park, Michigan plant the Curtis Machine and Standard Portable Cord Divisions at Jamestown, New York. Mr. DeMambro had been vice president of the corporation and general manager of the Curtis Machine Division.

Gene DeMambro

Upon his release from the Navy in 1946 Mr. DeMambro purchased the Curtis Machine Corporation of Jamestown, New York, at which time its entire line of abrasive belt sanding, grinding, and polishing machines was redesigned, with new machines introduced and plant facilities modernized and expanded. In 1946 Curtis Machine was merged with Lincoln Park Industries, and in February 1949 the organization was further expanded by the purchase of the Standard Portable Cord Company of Lincoln Park, Michigan.

DELBERT G. FAUST has been appointed chief engineer of the C. A. Norgren Co., Denver manufacturer of pneumatic equipment, according to Carl A. Norgren, president of the firm.

Delbert G. Faust

Mr. Faust has had extensive engineering experience in the East. He was with Walter F. Kidde Co., Bellville, N. J., for fourteen years, the past ten years of which were spent as chief project and test engineer.

In his new capacity, he will be in charge of all research and engineering activities in the development of new and improved oil fog lubricators, pressure regulators, air filters, relief valves and other pneumatic products in the Norgren line.

Mr. Faust holds an engineering degree from Lehigh University and is a licensed engineer in New York State.

WILFRED R. OGG has been appointed sales representative for northern New England by the grinding machine division of Norton Company, Worcester, Massachusetts.

HOWARD P. CHACE succeeds Mr. Ogg in charge of the sales engineering department.

Hercules Powder Company has announced the appointment of **HERBERT F. SCHAEFER** to the Sales Research Division. His duties will include market surveys and development for all products of the company.

Mr. Schaefer formerly was a research chemist in the Hercules Experiment Station. He received his B.S. and M.S. degrees in chemistry from the University of Alabama.

C. B. ROBINSON, vice president of Wyandotte Chemicals Corporation in charge of the J. B. Ford Division, retired on January 25 but will continue to serve as a sales consultant.

Mr. Robinson joined Ford in 1917, working his way up to the presidency of the J. B. Ford Sales Company in 1929. In 1943, when the company was made a division of Wyandotte, he became vice president of the parent organization.

According to a recent announcement, **GLOSTER P. HEVENOR** is now executive vice president of Aquadyne Corp., New York, N. Y., and will be responsible for the company's dust control activities.

For 18 years prior to joining Aquadyne, **Mr. Hevenor was associated with** The Johnson-March Corporation, of which he was president from 1943 to 1948. He is a registered professional engineer in New York State, past president of the Rochester Engineering Society, and past president of the New York State Assembly of the American Association of Engineers.

Seven additional men who will specialize in the sale of its industrial controls, valves, and Brown Instruments division pyrometer supplies have been named to the field staff of the Minneapolis-Honeywell Regulator Company.

The new appointees and the Honeywell branch office cities where each will make his headquarters are: **BRUNO KRAUSE,** Pittsburgh; **R. A. SCHWARZ,** Minneapolis and St. Paul; **T. SABOTTKE,** Hartford, Conn., **W. P. RYAN,** East Orange, N. J.; **D. FRITCH,** New York; **C. SWANSON,** Detroit; and **L. M. CROWE,** Cleveland.

C. R. H. Carlson

Watson Standard Co., Pittsburgh, Pa., manufacturer of industrial finishes, has announced the appointment of **C. R. H. CARLSON** as district manager in charge of the Chicago metropolitan area.

He previously was associated with Atlas Powder Co. in the development of technical coatings, with Pittsburgh Plate Glass Co. as paint sales manager in Michigan, and with Sherwin-Williams Co. His work during the war as lieutenant in the Quartermaster Corps Technical Division earned his membership with the "Gallows Birds," an exclusive group of men who wrote specifications for war materials.

Henry Fritz

HENRY FRITZ has been appointed field engineer to serve the baking industry in the Midwest for the Detrex Corp., Detroit 32, Mich., according to an announcement by A. O. Thalacker, vice president and general manager.

Mr. Fritz has had 22 years of experience in the manufacture, service, and sale of bakery machinery and food products. With Detrex, he will have charge of the sale and servicing of the company's modern bakery cleaning processes and cleaning depots in major Midwestern cities and the Chicago area.

For the present, Mr. Fritz will have his headquarters at 2149 N. 69th St., Milwaukee 13, Wisconsin.

The Link-Belt Co., Chicago, Ill., has announced the following changes in plant management personnel:

RICHARD E. WHINREY, now assistant general manager at the company's Dodge plant, Indianapolis, will assume the duties of assistant general manager at the Ewart plant, Indianapolis, on May 1.

RAYMOND S. WOOD, former general manager at the Minneapolis plant, has been transferred to Indianapolis to become assistant general manager at the Dodge plant.

LESLIE J. CARSON, now chief engineer at the Caldwell plant in Chicago, has assumed the position of general manager of the Minneapolis plant and the North Central sales division.

WILLIAM P. RIDSDALE, who has been chief engineer at Dallas and Houston since 1946 and who was formerly

(Left to right) R. E. Whinrey, R. S. Wood, L. J. Carson, W. P. Ridsdale

a member of both the engineering and sales departments at Caldwell, Chicago, has returned to the Caldwell plant to become chief engineer.

J. B. Willis, service manager for the Pemco Corp., Baltimore, Md., has announced that **WILFRED M. PAQUIN** has joined the company as a service engineer for the Ohio-Indiana area and will reside in Dayton, Ohio.

Mr. Paquin, a graduate of the New York State College of Ceramics Engineering, Alfred University, was formerly asssociated with the Ferro Enamel Corporation; Norge Division, Borg-Warner Corporation; Quaker Chemical Company; and The O'Hommel Company.

Also announced was the re-assignment of **THEODORE BUIT** as a service engineer from the Ohio-Indiana area to the Illinois territory, and **WILLIAM BLACKBURN** from the West Coast service staff as a color technician to the Pemco Color Laboratory in Baltimore.

R. M. Buckingham, president of the Buckingham Products Company, has announced the appointment of **R. O. BLACKFORD,** Grand Rapids, Michigan, as sales representative for its polishing and buffing compositions and foundry supplies in the Grand Rapids district.

William A. Munkacsy, president of Munray Products, Inc., Cleveland, Ohio, has announced the appointment of **THOMAS P. GALLAGHER** as assistant sales manager.

Mr. Gallagher, who was formerly associated with the Atlas Engineering Company as a sales engineer, will assist Ray W. Grace, vice president, in a sales expansion program.

At a meeting of the board of directors of Sun Chemical Corporation, **RALPH C. PERSONS** was elected a director and vice president of the Corporation.

Mr. Persons, who has been with Sun Chemical since May 1944, has served as sales manager of Geo. H. Morrill Co. Division and general manager of Eagle Printing Ink Company Division. In July 1946, he became general manager of the Geo. H. Morrill Co. Division. He will continue in this capacity and also be in charge of Sun's Graphic Arts Group.

WAYNE D. STALEY, formerly New York district manager for The Duriron Company, has been appointed general sales manager and will be located at the home office of the company in Dayton, Ohio. In directing sales and advertising activities, he will replace D. E. Jack, who has resigned as vice president in charge of engineering and sales.

Wayne D. Staley

R. F. SHARPE, former manager of the Philadelphia office, has been appointed New York district manager and **RALPH L. WATTS,** formerly sales engineer in New York, will be in charge of the Philadelphia office.

According to an announcement by N. A. Fowler, director of sales of the General Box Company, the following personnel changes have been effected since the consolidation of the Chicago and Louisville sales territories at Louisville:

GEORGE T. WALNE, vice president, has been transferred from Chicago to Louisville in charge of sales for the combined territories; **C. L. BRUCKERT,** who has administered sales in the Louisville territory, has been promoted to the position of division sales promotion manager; and **WILLIAM C. EMBRY** of Louisville, vice president and member of the General Box Company board of directors, remains as division manager.

G. Klinkenstein, president of the Smith-Davis Company, manufacturer of industrial and maintenance finishes, located at 10751 Venice Blvd., Los Angeles 34, California, has announced the appointment of **LEWIS B. KELLY** as sales engineer to cover part of the Los Angeles territory. Mr. Kelly has had many years of experience in the field of specialized production finishes as well as considerable experience in the field of trade sales products.

LET US PROVE – HOW YOUR FINISHING COSTS **CAN BE REDUCED** with

MURCO TUMBLING BARRELS

MURCO Tumbling Barrels are preferred today by plants that deburr, burnish, clean, polish, and smooth-surface metal and plastic parts on a mass-production bases. With its variable speeds, you have a wide range to meet various operating conditions and requirements . . . the special brake mechanism stops the barrel in any position, as well as facilitates loading and unloading . . . prevents accidental dumping of loads.

SAMPLE PARTS PROCESSED

At no charge or obligation. Write for details.

D. J. MURRAY MANUFACTURING CO.
WAUSAU WISCONSIN

Wagner Brothers, Inc., 432 Midland, Detroit 3, Michigan, manufacturer and supplier of polishing and plating materials and equipment, has announced the appointment of **H. J. BREITHART** as district sales manager, buffing and polishing products. He will also handle sales of the company's other products, Wagner-Tiedeman rectifiers, "Lectrocop" and "Flat-Top" copper anodes, "Wabrite" and "Iso-Cast" cadmium, zinc and tin anodes and the new automatic buffing and polishing compound applying devices known as the "Appli-matic" and the "Spray-matic".

H. J. Breithart

Mr. Breithart is well-known to the metal finishing industry through his past activities as sales manager of Bruce Products from 1926 to 1942, and later as Western manager of Divine Brothers. Recently, until his association with Wagner Brothers, Inc., he was vice-president of Yerges Manufacturing Company.

WILLIAM F. MACDONALD was elected president of E. F. Houghton & Company, at the annual stockholders' meeting held at the company's main offices in Philadelphia.

Mr. MacDonald, who will temporarily continue to hold his present office as treasurer, succeeds **MAJOR AARON E. CARPENTER,** who voluntarily relinquished the presidency and was elected chairman of the board of directors. By-laws provide that Major Carpenter, president since 1934, shall still remain the chief executive officer of the company.

Mr. MacDonald was graduated from Wharton School, University of Pennsylvania, in 1927 and entered the employ of E. F. Houghton & Company that year as a cost clerk. He has since served as industrial engineer, credit manager, and treasurer (1942). He was also named assistant to the president in 1946.

One new director was elected by the stockholders—**DR. JAMES T. EATON,** manager of research, who has been with the company since 1937. Dr. Eaton was

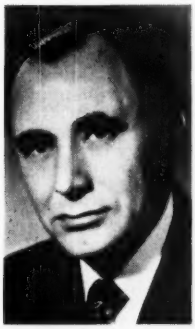
formerly a research chemist for National Aniline Division, Allied Chemical & Dye Corporation. He has headed Houghton's Research Department since 1946 and his chief interest has been in the development of new surface active agents.

Process Industries Engineers, Inc., Pittsburgh, Pa., engineers and contractors of special equipment, and manufacturers' representatives, have appointed **W. A. COYLE** as western New York district manager.

Companies which will be represented through Mr. Coyle's office at 6578 Broadway, Alden, N. Y., include the Patterson Kelley Company, International Engineering, Inc., Warren Steam Pump Company, Hetherington and Berner, Inc., B. H. Hubbert & Son, Inc., Gruendler Crusher and Pulverizer Company, Tri-Clover Machine Company, Waukesha Foundry and Machine Company and the Rietz Manufacturing Company. In addition to the Buffalo and Niagara frontier, Mr. Coyle will serve Rochester, Corning, Jamestown, Erie, and the surrounding area.

The Cambridge Wire Cloth Company has announced that **J. C. PETERS** has been assigned to the New England territory. Mr. Peters will maintain offices at 141 Milk Street, Boston, and 551 Fifth Avenue, New York City.

Herschel E. Post, general sales manager of industrial finishes for the Pittsburgh Plate Glass Company, has announced the appointment of **HAROLD R. BENNETT** as manager of industrial sales for Thresher Paint and Varnish Company, a Pittsburgh affiliate.



Harold R. Bennett

Associated with Thresher since 1930, Mr. Bennett has served in various manufacturing, laboratory, and sales capacities. His headquarters will be at Dayton, Ohio.

HONORS

Robert H. Brown

ROBERT H. BROWN, chief of chemical metallurgy at Alcoa's research laboratories in New Kensington, Pennsylvania, has been chosen by the National Association of Corrosion Engineers to receive the Whitney Award for 1950 in recognition of his outstanding contributions to the science of corrosion. The Whitney Award is international in scope and is one of the highest honors in the field of corrosion engineering.

Mr. Brown holds many patents related to his field and is the author of numerous articles on corrosion. An alumnus of Drexel Institute of Technology, he was graduated in 1927. He continued his studies at Massachusetts Institute of Technology as a research associate investigating corrosion mechanisms, and in 1930 was awarded the M.S. degree in chemical engineering,. Since 1931, he has been associated with Aluminum Research Laboratories where he now directs research on the chemical behavior of aluminum and magnesium alloys.

TRAINING COURSES

The **MASSACHUSETTS INSTITUTE OF TECHNOLOGY**, Division of the University Extension, 200 Newbury St., Boston 16, Mass., is sponsoring an electroplating course which has been especially designed for those who have completed "Introduction to Electroplating" or who have an elementary knowledge of chemistry and electrochemistry.

Topics discussed include the controlling factors in electroplating; the types of equipment and methods used for electroplating; and the plating baths and techniques in use for the deposition of cadmium, copper, chromium, nickel, tin, zinc, silver, gold, and other metals commonly electroplated.

Pictured here is a typical class of representatives from some of the country's largest industrial firms enrolled at the DeVILBISS COMPANY'S school for spray painting, now in its 25th year. Instruction is free of charge, and a year-round schedule of one-week classes is offered. Sessions are rotated to cover the needs of specialized groups, such as industrial equipment users, plant maintenance men, and others.

MEETINGS

The 32nd **ANNUAL MEETING** of the **AMERICAN ZINC INSTITUTE** will be held at the Hotel Statler, St. Louis, Missouri, on April 11 and 12, 1950. A number of interesting and worthwhile papers on the various phases of the zinc industry will be presented. Of particular interest to finishers will be a talk on "Developments in Galvanizing."

The annual dinner and smoker will be held on Tuesday evening, April 11.

The **ANNUAL BANQUET** of the **PITTSBURGH BRANCH** of the **AMERICAN ELECTROPLATERS' SOCIETY** has been set for Saturday, April 15, in the main ballroom of the Hotel Sheraton. Dinner will be served at 7:00, and entertainment and dancing will follow.

Cy Hungerford, nationally known cartoonist on the Pittsburgh Post-Gazette, will be guest speaker, according to John Davidson, Chairman of the Annual Banquet Committee.

The **ANNUAL MEETING** of **THE ELECTROCHEMICAL SOCIETY,** to be held in Cleveland, Ohio, at the Hotel Statler, April 19, 20, 21, and 22, will feature the following subjects; theoretical electrochemistry, rare metals, instrumentation, electrothermics, luminescence, industrial electrolytics, and electric insulation.

The next meeting of **THE PAINT & VARNISH EXCHANGE CLUB, INC.,** will be held Tuesday, April 18, 1950, in the Taft Room of the Hotel Taft, New York City.

Guest speaker will be Kenneth V. McCullough, Group Leader-Head of the Protective Coatings Development Department of the Bakelite Corp., Bloomfield, N. J., whose subject will be "Coating Resins Based on Styrenes." The member speaker will be William N. McKee, technical sales manager of the W. A. Cleary Corp., New Brunswick, N. J., who will speak on "Soya Lecithin."

The **ANNUAL EDUCATIONAL SESSION** and **BANQUET** of the **MILWAUKEE BRANCH** of the **AMERICAN ELECTROPLATERS' SOCIETY** will be held at the Schroeder Hotel on Saturday April 27th, 1950.

A Symposium on Bright Finishes will be presented at the afternoon Educational Session at 2:00 P.M. as listed below.

1. "Notes on Buffing and Polishing", C. F. Nixon, Ternstedt Division of General Motors, Detroit, Mich.
2. "Low Cost Finishing with Roto-Finish", C. H. Castle, Roto-Finish Company, Kalamazoo, Mich.
3. "A Buffing Nickel", Dr. M. M. Beckwith, Harshaw Chemical Company, Cleveland, Ohio.

A banquet and dance is planned for the evening, and a floor show will be presented to round out the entertainment.

All members and others who may be interested in plating are cordially invited to attend.

The **SEVENTH ANNUAL EDUCATIONAL SESSION AND DINNER-DANCE** of the **INDIANAPOLIS BRANCH, A.E.S.**, will be held Saturday, May 6, at the Indianapolis Athletic Club.

The educational session will include papers on rectifiers versus motor generators, high chloride nickel baths, and several other subjects.

Reservations should be made with Robert Bruck, 849 Massachusetts Ave., Indianapolis.

The **11th ANNUAL NEW ENGLAND REGIONAL MEETING** of the **AMERICAN ELECTROPLATERS' SOCIETY** will be held May 6, 1950, at the Hartford Club, Hartford, Connecticut.

An educational session, starting at 2:30 p. m., will include the following speakers and subjects: "Corrosion," by Kenneth M. Huston, Armco Research Laboratories, Baltimore, Md.; "Finishing of Zinc Die Castings," by C. F. Nixon, Ternstedt Division, General Motors Corp., Detroit, Mich.; and "The Metal Under The Plate," by Howard Boyer, Metallurgist, The Bosch Co., Springfield, Massachusetts.

There will be a banquet at 7:00 p. m., followed by entertainment and dancing.

The **37th ANNUAL CONVENTION** of the **AMERICAN ELECTROPLATERS' SOCIETY** and **FOURTH INTERNATIONAL CONFERENCE ON ELECTRODEPOSITION** (in collaboration with the Electrodepositors' Technical Society of Great Britain) at the Statler Hotel in Boston, June 12 to 15, 1950, promises to be an outstanding educational and social affair.

The well balanced technical program includes the following: two sessions on Smoothing and Levelling Processes in Electroplating; one session on the most recent results of the Society's Research Program; one session on Mechanical Finishing Methods; one session devoted to general topics, including new applications of electroplating (and electroforming) to the printing industry.

Members of the National Association of Electrotypers and Stereotypers have been invited to participate in the latter session.

In addition to the many pleasing entertainment features, including a luncheon for Electrodepositors' Technical Society Members in the U. S. and abroad, the Founder Members (1909-1913) of the American Electroplaters' Society, of whom unfortunately there are too few living today, will be honored.

SOCIETIES

The **FIFTH ANNUAL EDUCATIONAL SESSION AND DINNER-DANCE** of the **DAYTON BRANCH, A. E. S.**, held February 25 at the Hotel Biltmore, Dayton, Ohio, featured interesting and worthwhile papers presented by Jack Winters, R. O. Hull & Company; H. M. McAleer, president of the Formax Manufacturing Corporation; and R. W. Cook, president of the Fax Film Corporation.

The Toulmin Award, presented annually by the Dayton Branch to the A.E.S. member presenting the best paper before either the Cincinnati, Dayton, Columbus, or Indianapolis Branch, was made this year to Fred Bauch, Frigidaire Division, General Motors Corporation.

The Dayton Award, presented annually by the Dayton Branch to the A.E.S. Branch (of the four listed above) having the highest average attendance at meet-

Fig. 1 — Honorary Chairman Neill flanked by speakers Jack Winters, R. O. Hull & Company (left), and H. M. McAleer, Formax Manufacturing Corporation (right).

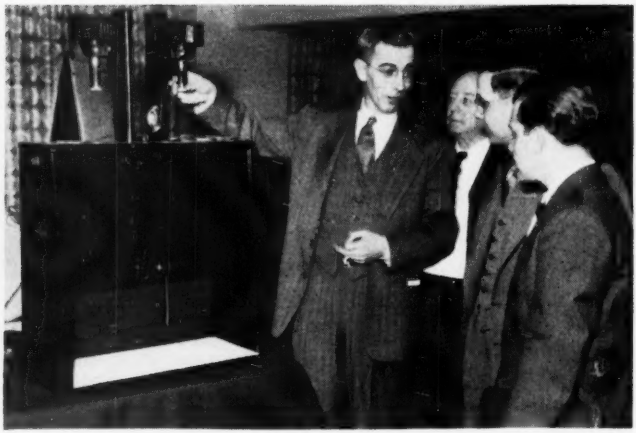


Fig. 2—R. W. Cook, president, Fax Film Corporation, the third speaker on the program, explains additional details of the Fax Film method of comparing surfaces to a group of electroplaters at the end of the formal presentation of his paper.

session was attended as usual by approximately 500 members and guests.

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ings during the past year, was won for the third successive time by the Columbus Branch. William J. Neill, first vice president, American Electroplaters' Society, and honorary chairman of the Dayton Branch meeting, in accepting this award for Columbus Branch, explained that this record had been achieved by his Branch because "on A.E.S. meeting nights we lock the doors of the Battelle Institute so that most of our members cannot get out until after the meeting."

The banquet following the educational

Fig. 3—A.E.S. First Vice President Neill accepts the Dayton Award trophy for the Columbus Branch from Elmer W. Rehme, president of the Dayton Branch.
(PRODUCTS FINISHING Staff Photos)

The gleaming white finish of the modern washing machine is strictly chemical in nature. It may be a glycerol-phthlate resin or a urea-formaldehyde resin or a combination of the two. In most cases. the finishes are baked at a moderately high temperature.

High frequency sounds can strip grease from metal in a matter of seconds, according to Dr. Robert O. Fehr, General Electric engineer.

Speaking before a meeting of the Albany Society of Engineers, he said that "ultrasonics", sounds pitched too high to be heard by the human ear, can be extremely useful to industry, particularly in tedious cleaning operations. He emphasized, however, that ultrasonics are not likely to be put to work cleaning dishes and clothes in private homes in the near future. The special needs of ultrasonic generators for these purposes would necessitate a large supply of electric power at a frequency hundreds of times higher than the usual 60-cycle household current.

In tests at the G-E General Engineering and Consulting Laboratory, small metal parts were cleaned of grime and grease in less than ten seconds by ultrasonics.

Dr. Fehr envisioned ultrasonics cleaning tanks along production lines, through which small parts would pass and be cleaned.

New Creations

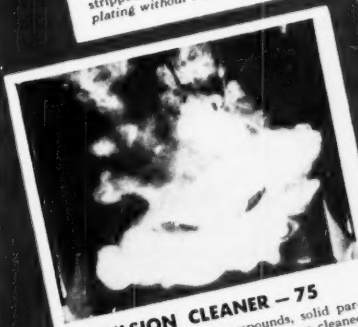
IN METAL FINISHING . . .

METAL STRIPPER — A

An outstanding development for stripping defective electroplated nickel, copper, silver, cadmium and zinc from steel. Fast action . . . no basis metal attack. The highly polished grill cover illustrated has been completely stripped of nickelplate, and is *ready for replating without repolishing.*

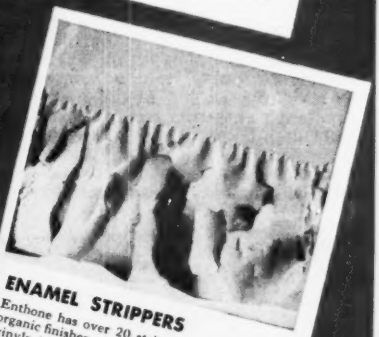
EBONOL BLACKENING PROCESSES

Ebonol finishes are used to beautify a widely diversified list of superior quality products. Photo shows steel parts blackened with Ebonol-S and S-30; copper and brass with Ebonol-C; zinc with Ebonol-Z. U. S. Patents —2,364,993, 2,460,896, 2,460,898.



EMULSION CLEANER — 75

Oils, greases, buffing compounds, solid particles, deep seated in steel parts are cleaned out and completely removed by this emulsification process. Stubborn, gummy substances on die castings, milling machines, floors, motor blocks emulsify and disperse in water instantly.



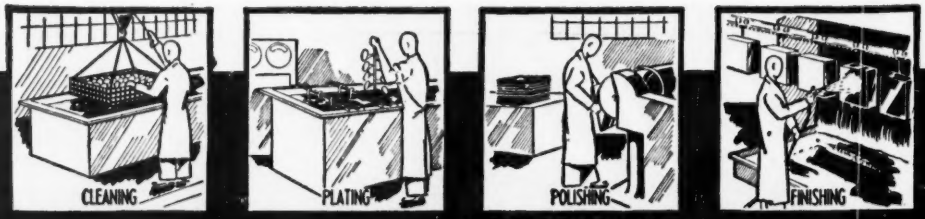
ENAMEL STRIPPERS

Enthone has over 20 strippers for removing organic finishes — synthetic enamels, lacquers, vinyls, japans. The best strippers, tailor-made for your particular problem, are selected by laboratory technicians after test runs. This service is rendered free of charge.

FREE. Beautiful colored literature together with step by step instructions for any of these Enthone Products will be sent without obligation upon request.

Enthone Incorporated

442 ELM STREET • NEW HAVEN, CONN.

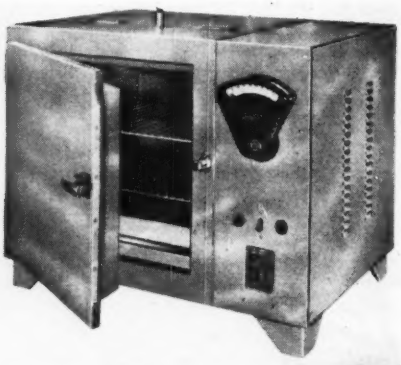


New • EQUIPMENT • MATERIALS • PROCESSES

Electric Gravity Convection Oven

The Blue "M" Hi-Heat Electric Gravity Convection Oven announced by the Modern Electric Laboratory, 306-308 W. 69th St., Chicago 21, Ill., is said to be ideal for production or laboratory work requiring precisely controlled clean dry heat above the average in baking, drying or preheating. Also useful in the tempering or drawing of carbon steels, high speed steels, non-ferrous parts, and so on, the oven has a double walled housing and a door of polished stainless steel. All vital joints are broken by means of asbestos tape.

The six sides of the oven have 5 inches of dual insulation, which it is claimed, will not settle or deteriorate with age.



Blue "M" Hi-Heat Electric Gravity Convection Oven

Fresh air is obtained by a series of intakes at the bottom of the oven and is diffused through a perforated diffused plate. An electric indicating and controlling hydraulic unit automatically maintains the temperature inside the oven, which is available in three series having ranges to 800, 1,000, and 1,200 deg. F. A positive closure door with pressure type explosion-proof latch is another feature of the oven, which also has two large 1-inch pilot lights, with all wiring totally enclosed.

Unichrome Primer A.P. 10

An air-drying and baking primer for all metals, including aluminum alloys, magnesium alloys, Monel, tin, steel, brass and stainless steel, copper, and galvanized metals, which can be sprayed, dipped on, or brushed on, designated as Unichrome Primer A.P. 10, is now being marketed by United Chromium, Inc., 51 E. 42nd St., New York 17, New York.

Outstanding properties claimed for the primer include fast air drying, short baking, easy application, maximum adhesion, flexibility, solvent resistance, excellent salt water, chemical, and weather resistance. Reduced material may be kept overnight, it is stated.

Palladium Plating Solution

A prepared solution from which metallic palladium can be deposited has been

Hammond

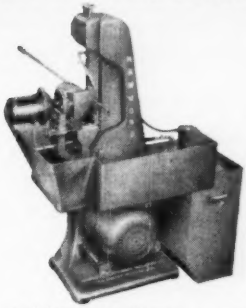
of KALAMAZOO

A COMPLETE LINE OF

GRINDING, POLISHING AND AUTOMATIC FINISHING MACHINERY

MODEL VRO LATHE

Variable Speed Polishing Lathes — Single and two spindle Lathes — 1500 to 3000 RPM. Also made in single speed models. Also furnished with Backstands for abrasive belt polishing.

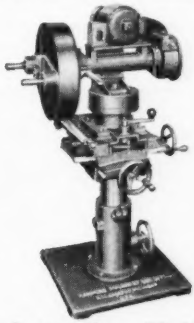


MODEL OD-1

Cylindrical Finishing Machines — For tubes, bars and cylindrical shapes: Model OD-1 up to 2¾" diameter polishing or buffing. Model OD-9 with polishing wheel or belt, for ¼" to 9" diameter.

MODEL 62-A1-8 Rotary

Strait-Line and Rotary Automatic Finishing Machines — For fast production finishing, polishing, buffing, deburring and brushing — Model 62-A1-8 Rotary shown. Write for catalog on Rotary and Strait-Line Automatics.



MODEL E2PF

Junior Automatics — 10 Models to choose from, according to work requirements. With one, two or four spindles — simple rotating spindle or stroke movement—for use in conjunction with polishing Lathes.

Hammond Machinery Builders INC.

1622 DOUGLAS AVENUE • KALAMAZOO, MICHIGAN

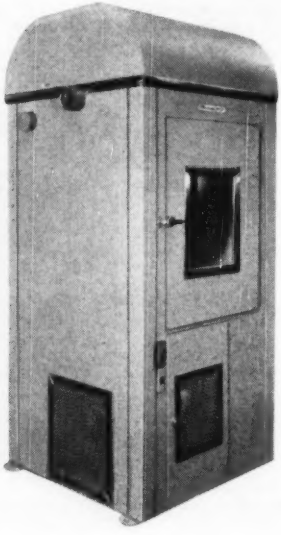
announced by A. Robinson & Son, 131 Canal St., New York 2, N. Y. Developed for scientific, industrial, and decorative uses, the plated coating is said to withstand salt spray, moisture, and other corrosive conditions. The hard and durable coating is said to be ideal for application in the electronics industry or in the manufacture of scientific and optical instruments.

The supplier states that the attractive white electrodeposit obtained from the palladium plating solution is economical to use for a wide variety of industrial and decorative purposes.

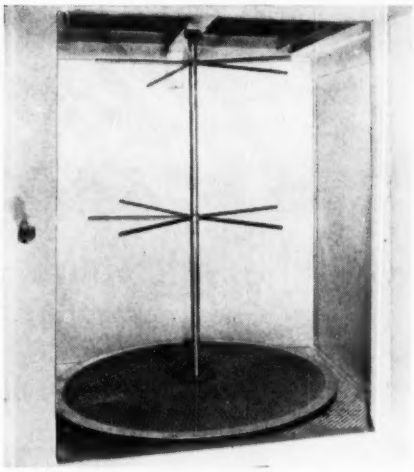
Technidrier

The Technidrier, product of Technic, Inc., 39 Snow Pl., Providence, R. I., is a practicable dryer which dries wet metal surfaces in less than two minutes, leaving the surfaces scratch and stain-free. Labor and time-saving features include elimination of rejects due to staining, elimination of alcohol and hot water rinses, ease of putting work in and taking it out, complete visibility of work in process through glass door, and simple installation and operation.

The Technidrier is equipped with adjustable spindles mounted on a turntable so that work can be removed or put in without disturbing other work in the process of drying. There are ten 14-inch spindles with a clearance of 14 inches, and the unit is adjustable to handle work up to 28 inches on five spindles, the combination accommodating either ten 14 x 14-inch racks or five 14 x 28-inch racks. The dryer operates on a 1 to 2-pound steam pressure and can accommodate bulk work.



Exterior view of Technidrier



Close-up view of interior of Technidrier

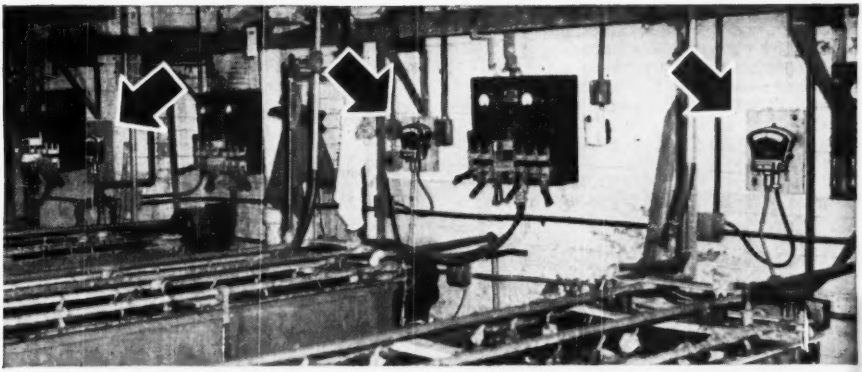
Tumb-L-Dur

Lupomatic Industries, Inc., 4510 Bullard Ave., New York 66, N. Y., has announced a material which can be used for fabricating barrels, as well as liners for existing barrels.

According to the manufacturer, Tumb-L-Dur is ideally suited for either the wet or dry process of tumbling. It has the necessary resilience, does not warp, has the strength of steel, and can readily be worked (sawed or drilled).

Multi-Purpose Lacquer

A multi-purpose lacquer, Base C 5015, which may be used to effectively finish all types of metal products, has been developed by the United Lacquer Mfg. Corp., 1001 W. Elizabeth Ave., Linden 8,



Improved Plating WITH SARCO

Controlled temperatures mean uniform, high quality plating, day in and out. You can control wash tank temperatures with the Sarco Thermoton at a cost of a few dollars. Most plating tanks can be controlled with the Sarco "LSI" electric control which costs much less than most methods. For special and highly accurate controls for vapor-line and heating and cooling there are a dozen different Sarco combinations. Four types of Sarco Steam Traps help reduce fuel costs.

SARCO CATALOGS

No. 1025
LSI ELECTRIC CONTROL

No. 700
TR-40 COOLING CONTROL

No. 650
VAPOR-LINE CONTROL

No. 600
TANK TEMPERATURE CONTROLS

No. 550
THERMOTONS

Nos. 250, 350 & 450
THERMOSTATIC, BUCKET AND FLOAT-THERMOSTATIC STEAM TRAPS

No. 1200
PIPE LINE STRAINERS

219-A

SARCO
SAVES STEAM
IMPROVES PRODUCT QUALITY AND OUTPUT

SARCO COMPANY, INC.
Represented in Principal Cities
Empire State Building, New York 1, N. Y.
SARCO CANADA, LTD., TORONTO 5, ONTARIO

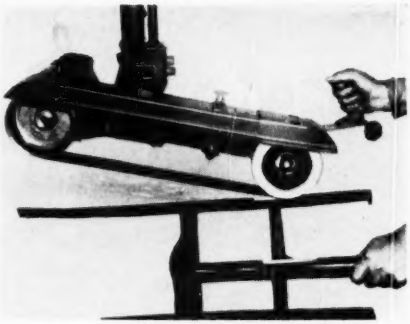
N. J. It is said to meet high performance standards on cold rolled steel, silver, and other metals, and provides an excellent gloss, hardness, and repellence to abuse.

Base C 5015 may be applied by spraying or dipping, and is available in clear or colors, in either a full gloss, semi-gloss, or flat finish. A special thinner, Base TO 939, has been formulated to reduce the lacquer and provide unusually fine flow.

Newton Swing Belt Grinder

Vonnegut Moulder Corp., Indianapolis 25, Ind., announces the manufacture of the Newton Swing Belt Grinder. The machine is equipped with a push-button controlled, 1½ h.p., 3-phase or single-phase, 3600 r.p.m. motor driving a 2½ x 60-inch coated abrasive belt on a 6-inch diameter contact wheel. It is light and conveniently maneuverable because the primary parts are assembled in aluminum castings on a frame of thin-walled steel tubing.

When suspended directly from a ceiling or overhead beam, the grinder can be used to work over an area of 4 to 5-feet diameter but can be swung to cover an area of 8 to 10-feet diameter when suspended from a simple and easily attached overhead radial arm and trolley. It has a handle bar for two-hand manipulation and also an intermediate horn-type grip for convenient one-hand operation.



Newton Swing Belt Grinder in use

The frame is pivoted at the point of suspension, allowing 10-inch normal vertical motion of the contact wheel. It also is pivoted to allow both right and left-hand angular positioning of the contact wheel. Details of design include dependable belt tracking control and a telescopic frame construction with concealed spring for automatically maintaining correct abrasive belt tension.

The machine is recommended for grinding, sanding and polishing of parts and assemblies which are either too heavy or too bulky to be worked upon with floor-type grinders and polishers. The overhead suspension also is said to make it an ideal machine for production-line operations on smaller parts, as well as larger assemblies.

Interchangeable Barrel Tumbling Machine

A small tumbling barrel machine suited for burnishing, tumbling, sawdust drying, deburring, or plating of jewelry or similar small items has been introduced by J. Szeremany, 58 Lexington Ave., Maplewood, New Jersey.

The unit is said to permit interchanging of barrels for the spcific type of operation desired. Both steel and wood barrels are available in 10 and 14-inch base diameter sizes. Three speeds are obtained by cone pulley drive. The machine occupies a bench space of 14 x 18 inches.

FASTER, BETTER FINISHING with HARRISON'S NEW

4A

BUFFING *and* POLISHING COMPOUNDS

You send us a sample of metal used. We will return finished sample together with compound for your specific requirements.

Speed up production with correct compositions.

HARRISON & COMPANY, INC.

Haverhill, Massachusetts

One Lacquer, so clear it's invisible,

with multiple protection for . . .

Dulac Clear Universal Lacquer #462

● Here's an M&W finish that permits accurate retention of all desirable surface qualities of most metals . . . that adds lasting protection against heat, cold, weather, corrosion, stain and perspiration — Dulac Clear Universal Lacquer #462. It's formulated to give good adhesion with either the spray, dip or brush method. And it fits into fast production schedules because in five to ten minutes this successful general purpose lacquer dries out of dust . . . hardens in one hour. For complete information, write for Technical Data Bulletin 110 or let an M&W technical consultant discuss your requirements privately with you.

PIONEERS IN PROTECTION
M.&W.Co. 1876

. . . where industry goes with finishing problems

MAAS & WALDSTEIN COMPANY

Newark 4, N. J. • Chicago 12, Ill. • Los Angeles 34, Calif.

Pacific Coast Division: SMITH-DAVIS CO., 10751 Venice Boulevard, Los Angeles 34

MANUFACTURERS OF INDUSTRIAL FINISHES

Improved Magna-Sight Flow Gauge

A completely redesigned Magna-Sight Flow Gauge has been announced by the Fischer & Porter Company, Hatboro, Pa.

Improved Magna-Sight Flow Gauge

The unit consists of a short body, with flanged or screwed pipe connections, which accommodates a fixed orifice in the lower end. A tapered metering plug carries a permanent magnet, and a hollow, cylindrical, soft-iron follower rides in an external slot. Covering the slot is a plate on which is engraved a scale calibrated either in gallons per minute or in millimeters. The position of the follower relative to the scale indicates flow rate.

The Magna-Sight Flow Gauge is available in brass, bronze, iron, steel and type 316 stainless steel; in sizes from ¾ to 4 inches, and with maximum capacities from 3.5 to 250 g.p.m. (Minimum capacity is one tenth of selected maximum.) The flow gauge can be used for clear and opaque liquids, such as electroplating solutions, slurries and other fluids, and accuracy averages about 5 per cent over the scale range, it is stated. Temperatures up to 400 deg. F. and pressures up to 500 p.s.i. can be accommodated.

Small Portable Stainless Steel Filter

Ferm Industries, Inc., 95 Wooster St., New York 12, N. Y., is offering a 4 g.p.m. welded filter for acid or alkaline plating solutions, said to be especially suitable for precious metal solutions and use in plating laboratories where a fine degree of filtration is required.

Except for the 10-foot chemical hose and the filter pre-coat, the solution comes in contact only with stainless steel, including pump and 110-300 mesh woven-wire filter media. The filter is cleaned by back washing. The motor is a 110-volt, single-phase a.c. unit.

Adjustable Ground Clamp

Blackburn Specialty Co., 6541 Euclid Ave., Cleveland 3, Ohio, is offering an adjustable ground clamp in two sizes, one to fit ⅜ to 1¼-inch pipe and the other, ⅜ to 3-inch pipe. A tightening screw chafes the pipe, draws up slack, cuts through rust and dirt, and at the same time contracts bands around the pipe surface, assuring a perfect ground.

Solder or solderless terminal types are available for low or high-amperage grounding of electrical equipment, conduits, armored cable, and so on.

Pyrene Seamless Extinguishers

The Pyrene Manufacturing Co., 560 Belmont Ave., Newark 8, N. J., is offering its 2½-gallon foam, soda-acid, and cartridge-operated fire extinguishers with highly polished alloy shells having no dome or side seams, said to provide added strength and longer life. The extinguishers also have tough transparent plastic nozzles which are claimed to be highly resistant to damage or distortion and which provide quick visual inspection to determine whether nozzle openings are clean and unobstructed.

Pyrene Seamless Extinguishers

Once heat requirements are determined, duplicating the heat without guess-work is simply a matter of setting the CHROMALOX Input Controller's dial to the logged point.

CHROMALOX Electric Radiant Heaters . . . the flexible, dependable, all-metal heat source for infrared drying, curing, baking, preheating, etc. . . . give uniform, glareless radiation absorbed equally fast by all colors. Shockproof, moisture-proof, dust-proof units come ready to install individually or in banks, tunnels, or ovens.

Get the NEW APPLICATION FILE ON RADIANT HEATERS

It contains data you should have about this new, entirely different production tool. You might apply its valuable information to your own heating problems.

EDWIN L. WIEGAND CO., 7552 THOMAS BOULEVARD, PITTSBURGH 8, PA.

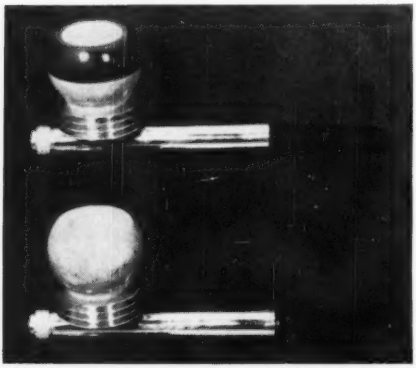
CHROMALOX 18-96 B

ELECTRIC HEAT FOR MODERN INDUSTRY

Alumetex Process

MacDermid Inc., Huntingdon Ave., Waterbury, Conn., has announced its Alumetex Process for electroplating on aluminum.

Outstanding features claimed by the manufacturer for the process are: one process for all regularly-used alloys of aluminum; excellent corrosion resistance and adhesion obtained by simple immersion treatments; complete elimination of



The Alumetex Process is used in preparing aluminum parts for the pipes, shown in the photo, for plating.

blisters, pits, and dull deposits; sand castings, die castings and wrought aluminum can be processed through the same cycle.

The Alumetex Process has been tested and proved in production for the past three years, under various conditions.

Flexible Shaft Machine

Product of Wyzenbeek & Staff, Inc., 822 W. Hubbard St., Chicago 22, Ill., the Wyco Lo-Gravity Flexible Shaft Machine is now available in a modernized and redesigned model with a fully enclosed drive.

Made from steel stampings and joined by welding, the machine is said to be light in weight and exceptionally strong. The location of the motor on the tripod base of the machine provides excellent stability.

The base of the machine is constructed so that any motor of suitable horsepower will fit. The use of a three or four-step V pulley has increased the range of the application of the equipment by reason of the ease with which different speeds

Wyco Lo-Gravity Flexible Shaft Machine

can be selected. Added features include an accentric belt adjustment on the jack shaft and a locking clamp located on top of the machine for holding the handpiece when the machine must be used for stationary grinding.

Strippable Protective Coatings

Fidelity Chemical Products Corp., 470 Frelinghuysen Ave., Newark 5, N. J., manufacturer of metal cleaning and stripping compounds, has announced the availability of its latest developments: Strippable Coating SP-14 for enameled, lacquered and plastic surfaces, and Dip-Pak No. 532, a hot melt coating for metal parts, such as as tools, gears, and machined components. Both of these new products serve as temporary protection during processing, storage and shipping.

Fidelity SP-14 is a light, cream-colored liquid with good stability and, due to a neutral pH, will not affect color or any type of finish to which it is applied. According to the manufacturer, it constitutes no fire hazard, introduces no toxic condition in spraying, and requires no expensive solvents to clean the spray gun used to apply the coating. When dry, the film is non-flammable, elastic, tough, abrasive resistant, and it adheres strongly to the surface to which it is applied. Yet the film can be removed by a steady pull when desired.

For best results, it is recommended that the parts over which SP-14 is sprayed be passed through a drying oven at a temperature of 140 to 150 deg. F. for a period of approximately fifteen minutes. Oven drying is not necessary if the SP-14 film

HARSHAW PROCESSES
FOR THE PLATING INDUSTRY

Acid Tin
Tin Fluoborate
Lead Fluoborate
Copper Fluoborate
Bright Nickel
Perflow Nickel
Lead—Tin Alloy Plating
Nibrite Barrel Nickel

CHEMICALS AND ANODES FOR MOST PLATING NEEDS

Cadmium Ball Anodes
Cadmium Chloride
Cadmium Oxide
Cadmium Sulfate
Chromic Acid
Copper Fluoborate
Lead Antimony Anodes
Lead Tin Anodes
Lead Fluoborate Plating Solution
Nickel Anodes
Nickel Carbonate
Nickel Chloride
Nickel Salts, Single
Nickel Salts, Double
Perflow, Nickel Addition Agent
XXX Bright Nickel Addition Agents
Silver Cyanide
Tin Ball Anodes
Tin Anodes, Cast
Tin Fluoborate
Zinc Ball Anodes
Zinc Anodes, Cast

HARSHAW

Harshaw has been producing anodes and salts for electroplating for over 50 years and ranks among the leaders supplying the plating industry.

Many of the significant advances in electroplating processes and improvements in materials are a result of Harshaw research in this field. The practical experience of our field men is constantly being translated by our research laboratories into new developments for better plating.

THE HARSHAW CHEMICAL CO.
1945 East 97th Street, Cleveland 6, Ohio
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For further information contact the Harshaw office nearest you

Chicago 10, Ill. **Detroit 28, Michigan** **Los Angeles 17, Cal.** **Philadelphia 3, Pa.**
Cincinnati 2, Ohio **Houston 11, Texas** **New York 17, N. Y.** **Pittsburgh 3, Pa.**

is allowed to air-dry for approximately one hour and to remain on the part for at least 48 hours before peeling.

Fidelity Dip-Pak No. 532 is a hot melt coating for the temporary protection of metal objects, precision tools, gears and machined parts during both storage and shipping. It is received in briquette form and, when melted and applied to a metal object, provides a pale, transparent, tough, abrasive resistant, moisture resistant and rust resistant coating. A coating of Fidelity Dip-Pak No. 532 sets up almost immediately as is comes into contact with the air. It is removed by simply lifting the coating down the middle and peeling off the skin. The material is 100 per cent solids and can be used over and over again by simply remelting. Fidelity Dip-Pak No. 532 is essentially non-flammable during application. The coating resists corrosion under all climatic and weathering conditions, the manufacturer states.

GS Safti-Mitt Handpads

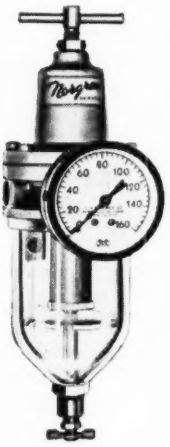
Product of the General Scientific Equipment Co., 27th & Huntingdon Sts., Philadelphia 32, Pa., the GS Safti-Mitt Handpads offer maximum protection and comfort.

Made of toughest horsehide, with an adjustable leather strap and fastener, assuring good fit for any size hand, the Handpads are especially made for handling metal sheets, stampings, sharp-edged castings, cartons, cases, and many other uses where hand injuries are a risk.

GS Safti-Mitt Handpads

Filter-Regulator

Measuring 11 inches high, the Norgren Filter-Regulator shown herewith, product of the C. A. Norgren Co., 222 Santa Fe Drive, Denver 9, Colo., combines filtering and pressure regulating in one compact unit designed for use with air and any non-corrosive gas at pressures up to 125 p.s.i. and ambient temperatures up to 120 deg. F. Said to be easily installed in line pipe connections and easily dismantled without removing from the line, the unit is recommended for use as original equipment on production machines and as plant equipment for spray-painting lines, for instrument control and general industrial air line use.



Norgren Filter-Regulator

The filter has a directional inlet which creates a centrifugal action, throwing moisture and entrained solids against the bowl where they run down into a quiet zone beneath the baffle. A screen of reinforced 200-mesh Monel wire removes remaining solids. This cylindrical screen has a surface area ten times that of the pipe opening, thus reducing air velocity and improving filtering action. The bowl is fully transparent, showing the filtering action, condition of air line, and amount of collected moisture.

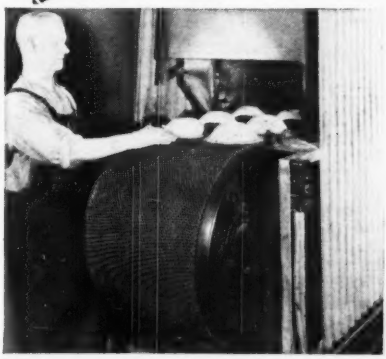
The regulator is claimed to provide for maximum air flow with minimum pressure drop due to the baffle plate and siphon tube action. The regulator is said to quickly respond to sudden demands for large volume without excessive momentary pressure drop.

Surfamax Porous Stainless Steel Filter

Extreme compactness and ease of operation are provided by the Surfamax Porous Stainless Steel Filter, product of Micro Metallic Corp., 193 Bradford St.,

NO WASTED MOTION HERE

with *Cambridge* WIRE BELTS



A Cambridge Rod-Reinforced Belt permits continuous, uniform heat treating of metal parts. Open mesh assures free circulation of heat and air—design gives greatest strength, straight travel and successful operation up to 2100° F.

Cambridge Wire Belts are efficient workers in your field. They serve in heat, cold, corrosive and wet processes; through packaging and assembly operations—moving quickly or slowly at constant or varying speeds. Wherever a material can be processed during movement, a Cambridge belt can, and does, save time, money and floor space.

Cambridge offers you a modern engineering staff with experience in your field and skilled workmen to produce the right belt in the correct mesh and weave, metal or alloy to perform your operation better . . . for longer.

Consult your Cambridge representative — look under "Belting, Mechanical" in your Classified Telephone Directory or write direct.

FREE BOOK—Famous throughout industry as the most valuable reference work on belts and conveyor systems. Write for your free copy . . .

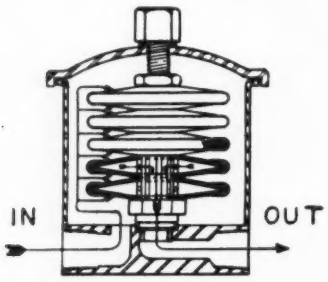
Cambridge Wire Cloth Co.

Department A
Cambridge 4, Md.

Wire cloth in rolls. | Also specialized wire fabrications

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

Brooklyn 7, N. Y. Supplying a maximum filter area in a convenient small container, the unit is designed to provide continuous service with a minimum of maintenance. The simple positive operation claimed by the manufacturer may also be completely automatic.



Cross-section view of Surfamax Porous Stainless Steel Filter unit assembly

The filter elements are in the form of corrugated assemblies, having the general shape of an accordion. Available in six pore openings, ranging from 5 to 165 microns (0.0002 to 0.0065 inch), uniform pore sizes are offered, closely limiting the size of the particle which can pass through the filter. Unusually high flow rates are obtained for liquids and gases because of the extremely high percentage of voids, it is stated. For simplified servicing, a single nut opens the filter container and the element may be removed in a matter of seconds.

Anodizing in Color

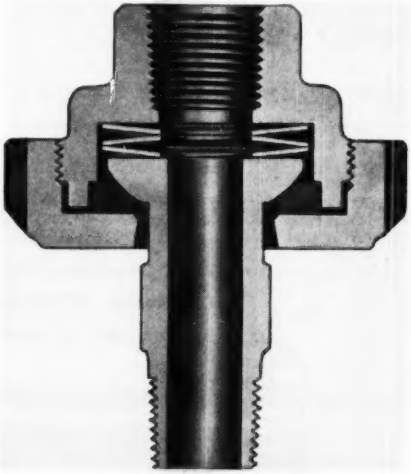
When made of certain selected alloys of aluminum and electrolytically processed by the Mirrordip Electrodizing Process, developed by the Technical Processes Div., Colonial Alloys Co., Philadelphia 29, Pa., buttons, buckles, fasteners, and ornaments, which are resistant to both dry-cleaning and laundering, can be made to match practically any color except pure white. Dull matte, diffuse or reflective specular surface effects are available in many colors, including blue, green, red, in solids and pastels, and brown, wine and black.

The colors are not plated on the aluminum as copper or nickel or chromium is plated on a metal. Instead, the colors are absorbed and fixed into the electrolytically treated aluminum surfaces so that they become a part of the metal. Gold, silver, copper, nickel, chromium, rhodium, or other metal effects can be produced that have much better wear and corrosion resistance than the plated metals themselves, lacquered or unlacquered, the manufacturer states. Peeling, chipping, or lifting cannot occur. The finishes are resistant to handling, atmosphere, food stains, alcohol, and many chemicals including acids and alkalies. No lacquers are required.

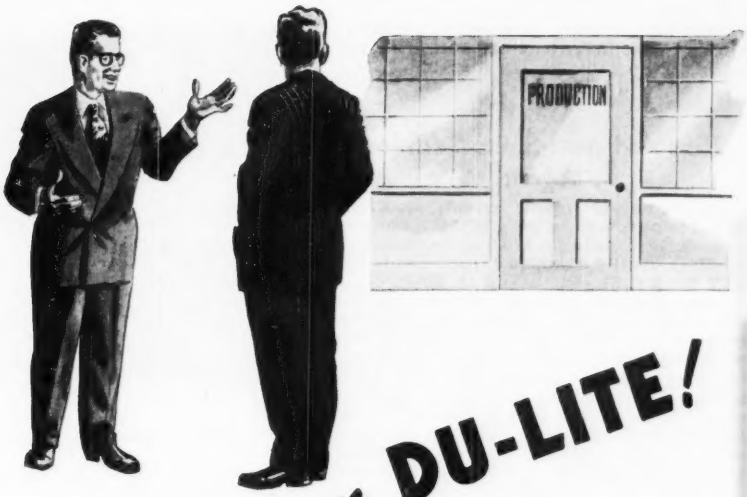
Rotary Swivel Joint

The Barco Manufacturing Co., Dept. 116, 1801 W. Winnemac, Chicago 40, Ill., has announced a rotary swivel pipe joint for swivel and slow revolving applications which will handle practically all fluids and gases, including corrosive acids and alkalies. Its design is said to eliminate wedge action of the ball against the gasket; thus, the turning torque is almost completely eliminated. The ball is held in place by a Belleville spring.

Features of the unit claimed by the manufacturer include a small amount of side flexibility which reduces the possibility of wear or breakage from side strain. It performs without leakage at extreme temperatures, and extra heavy models are available for extreme pres-



Rotary Swivel Joint



"I'm sold on DU-LITE!

. . . and here's why. When you are running a large volume of steel parts in your black oxidizing bath, you cannot afford to have any stoppages or slow-downs because of inefficient operation. After installing DU-LITE, our black finishing trouble was over. Now the process is fast and sure and, what is more, the process is inexpensive to install and simple to operate. The Du-Lite Chemical Corporation also has factory trained engineers to get you started and find the workable answers to every finishing problem that arises."

While matching or excelling, in every respect, any other process for the chemical blacking of steel, except stainless, DU-LITE remains less costly to operate than most, so why not DO IT RIGHT WITH DU-LITE. *Write, or phone today.*

THE DU-LITE CHEMICAL CORPORATION

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sures and vacuums. Successful performance has been obtained at continuous rotation up to 30 r.p.m., it is stated.

Rins-Aid Anti-Stain Addition Agent

An anti-stain agent, known as Rins-Aid, for addition, in very small amounts, to a static rinse tank, has been announced by R. O. Hull & Company, Inc., Dept. X4, 1273 W. 3rd St., Cleveland 13, Ohio.

According to the manufacturer, Rins-Aid is said to form a water-repellent film on freshly plated work, thus leaving the work virtually dry as it leaves the rinse tank. A concentrated product, Rins-Aid is added to the water rinse in the amount of about 10 oz./per 100 gal. of water. Although Rins-Aid may be used in the final rinse, it is preferred to make the addition to the rinse tank just before the last dip.

Among the advantages claimed for Rins-Aid are: after dip, plated work is virtually in complete freedom from water staining; a buffed appearance is imparted to the surface; greater ease of drying; a lower temperature than usual in the final hot water rinse may be used.

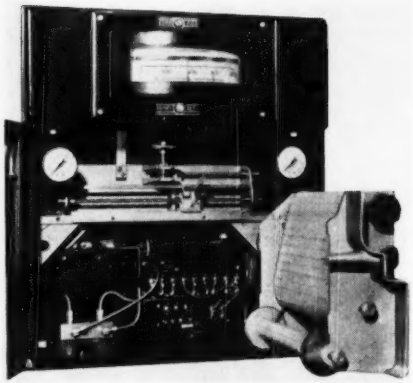
XLN Magnet Wire Enamel

An enamel developed to provide longer life and greater efficiency for electrical equipment, known as XLN, has been announced by the Standard Varnish Works, 2600 Richmond Terrace, Staten Island 3, New York.

According to the manufacturer, the enamel has been improved in three important characteristics: increased heat resistance; economical application without costly dies; and superior resistance to abrasion in the actual magnet winding.

Wheelco Pneumatic Capacilog

Known as the Pneumatic Capacilog, an air-operated strip chart recorder has been added to its line of instruments by the



Wheelco Pneumatic Capacilog

Wheelco Instruments Co., Chicago 7, Illinois.

Completely self-contained and having only two external air connections, the unit is claimed to easily and accurately measure temperature, speed, flow, pressure, static grain loads, a.c. and/or d.c. volts, amperes, and so on. The control function is performed by the smooth floating power of air, via the Wheelco Electronic Link, operating diaphragm motors connected to valves, dampers, levers, pistons, and so on.

Duron

The Electro Chemical Supply & Engineering Co., 750 Broad St., Emmaus (Allentown), Pa., has announced a type of thermosetting resin called Duron which is used for the manufacture of acid and alkali-proof cements for joining brick and tile, as a coating for concrete, steel, or wood, and as an impregnant for wood. Useful materials may be produced by mixtures with metal powders, asbestos, cork and other insulating materials.

Duron is claimed to adhere without the use of a primer to concrete or metal, and is self-hardening at room temperature.

For a real good polishing job use

Keystone TURKISH Emery

FRESH SUPPLY AVAILABLE

KEYSTONE EMERY MILLS *Write for Sample* **4316 Paul St., Phila., Pa.**

Start Clean...

Stay Clean!

It's the rule of the sea...and the plating industry!

Don't risk the time, labor, and expense that go into cleaning work for plating by putting clean work into a plating bath of questionable purity!

Start clean . . . *stay* clean — use Darco S-51 to trap trouble-making impurities! Darco adsorbs impurities to its surfaces before they can be deposited on the freshly cleaned surface of your work.

Is your plating bath as clean as the water in your final rinse?

Darco S-51 is especially easy to handle . . . to wet . . . to incorporate into a slurry. It's especially treated for use in plating — *the only carbon that will meet the benzol-mercury test!* Place an order for Red Label Darco S-51 today. Practically all leading suppliers carry Darco — don't accept substitutes!

DARCO CORPORATION

60 East 42nd Street, New York 17, N. Y.

It is inert to solvents, fats, oils, greases, alkalies of all concentrations, and to a wide range of acids, the manufacturer states.

Industrial Flashlight Battery

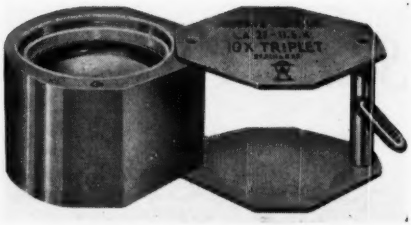
The National Carbon Division, Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y., has announced the construction of its Eveready No. 1050 Industrial Battery. The container, formerly made of zinc, is now made of carbon, with a zinc power vane as the center element. The carbon is inert to electrolytic action and, hence, will never perforate irrespective of battery age or degree of discharge. The new cell has no metal can to leak or corrode, and it will not swell, stick, or jam in the flashlight, the manufacturer claims.

Advantages of the battery include interchangeability with all standard-size flashlights and more than double the usable light.

Pocket Microscope

Stratex Instrument Company (formerly Mohave Instrument Co.), Los Angeles 27, is now manufacturing an improved 10 power Hastings triplet pocket microscope for quality control and line inspection of finishes, tools, small parts, pigments, textiles and granular materials. The extreme brilliance and flatness of the color-free field fills the heavy demand for an inexpensive and readily available instrument for visual detection of minute flaws and defects in welds, dies, castings, stampings, plated parts, and components fabricated of metals, plastics, rubber, glass and textiles.

For maximum protection in both plant and field service, the 3 cemented lens elements are mounted in a hard finished aluminum cell protected by a non-magnetic stainless steel frame. An extra heavy nickel silver jump ring provides for attachment to watch chain or cord, so that the instrument may be readily available for instant service.



Hastings Pocket Microscope

PRODUCT LITERATURE

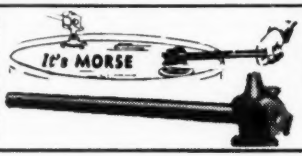
The publications listed in this section may be obtained free upon written request on company letterhead to the manufacturers concerned. Your courtesy in mentioning PRODUCTS FINISHING when requesting copies of these publications will be sincerely appreciated by the manufacturer and the publisher of this magazine.

"Special Finishes for Special Applications" is the title of a catalog available from the Stanley Chemical Co., East Berlin, Conn., describing its variety of industrial coatings for increasing product utility value and sales appeal.

Electroplating Anodes. A four-page two-color bulletin describing and illustrating its Wabrite cadmium ball anodes, flat top anodes (copper and zinc), and Iso-Cast anodes may be obtained from Wagner Brothers, Inc., 432 Midland Ave., Detroit 3, Michigan.

Delta Belt Grinding, Polishing, and Deburring Machines. The Power Tool Div., Rockwell Mfg. Co., Milwaukee 1, Wis., has released a six-page folder listing operating characteristics and advantages of its four models. Accessories are also pictured and discussed, and prices of all the units are included.

Send NOW for this FIT-ALL
DRUM PLUG WRENCH
Instantly loosens, tightens 95% all plugs or bungs in steel drums. Has 16" extra-strong steel tubing handle. Wgt. only 2 lbs. Order 1 or more today!



THOUSANDS IN USE saving time, labor, accidents!
SATISFACTION GUARANTEED... **$2.60**
Non-sparking type $4.00
Plus Parcel Post
MORSE MFG. CO., Inc.
124 Dickerson, Syracuse 2, N.Y.

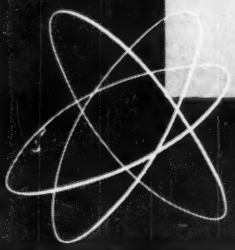
Palladium

PLATING SOLUTION

FOR ELECTRONIC APPLICATIONS

Ours is a self-sustaining solution, working from anodes. Gives excellent results in plating connectors, wave-guides and other electronic equipment where specified.

We make the anodes, too.



Baker & Co., Inc.

113 ASTOR ST., NEWARK 5, N. J.

New York • San Francisco • Chicago

Enthone Cleaner S-61 for the removal of oil, grease, and buffing compounds from copper and steel is the subject of a bulletin available from Enthone, Inc., Dept. PF, 442 Elm St., New Haven, Connecticut.

"Field Information on the Arrest and Control of Rust" is the title of a six page engineering data sheet released by the International Rustproof Corp., 12507 Plover Ave., Cleveland, Ohio. The report, based upon the findings of years of intensive study by engineers and technical specialists, is presented in layman's language, clearly illustrating and describing the causes, effect, and proper means for control of rust.

"Munray Products for Industry" is the title of a brochure prepared by Munray Products, Inc., Sales Division of The Poly-Cyclo Products Co., 12400 Crossburn Ave., Cleveland 11, Ohio, which describes the company's line of corrosion resistant materials and equipment, including organic coatings, industrial finishes, adhesives, process equipment linings, moldings, and extrusions.

Beach Hand Block Belt Sander. Beach Manufacturing Co., Montrose, Pa., is distributing a four-page illustrated catalog describing operating characteristics and advantages of the Beach Hand Block Belt Sander used in a variety of finishing operations. The machine may be used for sanding operations on products fabricated from aluminum, brass, bronze, stainless steel, as well as wood and plastics. Complete specifications of the machine are included in the catalog.

GOLD PLATING SOLUTIONS

In All Colors

Guaranteed 100% Pure Gold Content
Troy Weight - Color Constant
Tarnish Resistant

Proven Quality by the Acid Test

Write or call our experts about your plating problems

Davis-K-Products Co.

54 West 22nd St., New York 10, N. Y.
Oregon 5-0094
5-0095

Paint Spraying Equipment. A 62-page catalog presenting its complete line of industrial paint spraying equipment is available from the M & E Mfg. Co., Indianapolis, Ind. The applications of all the products are explained in detail, and a comprehensive price list section is included.

Type G Corrosion Resistant Centrifugal Pumps. Bulletin 53, prepared by The La Bour Co., Inc., Elkhart, Ind., describes and illustrates Type G self-priming vertical-type pump, which is available in a number of sizes and features an impeller with integral hydraulic seal instead of stuffing boxes or mechanical seals which may pass air or liquid.

Asphalt Mastic Flooring. The acid resisting, waterproof, slip-proof and long-wearing qualities of Rulon Asphalt Mastic Floors for every industrial need are presented in an illustrated catalog offered by Ralph V. Rulon, Inc., 3900 N. 2nd St., Philadelphia 40, Pa. Full information concerning these floors, together with specifications, are contained in the catalog.

Suggested applications include photo-engraving rooms, pickling and plating rooms, and industrial waste disposal plants. The catalog describes the properties of various Rulon products, and shows construction methods for the successful use of the acid resisting materials.

Catalog No. 50. Hammond Machinery Builders, Inc., 1625 Douglas Ave., Kalamazoo, Mich., has announced the release of a complete catalog describing the new Hammond Super Model K-46-6 indexing Rotary Automatic Finishing Machines, featuring rapid indexing, variable work spindle speeds and variable dwell time. The new Model K series machines have been designed to handle comparatively large work such as small frames for automobile instrument panels, automotive accessories, builders' hardware, plumbing fixtures, electric appliances, household appliances, utensils and pots and pans. The catalog also describes the smaller J Series indexing and continuous Rotaries, Strait-line Automatics and various types of abrasive belt and wheel type heads, suitable for a widely diversified number of grinding, polishing, buffing or deburring operations.

KNOCKOUT

What sports use these terms?

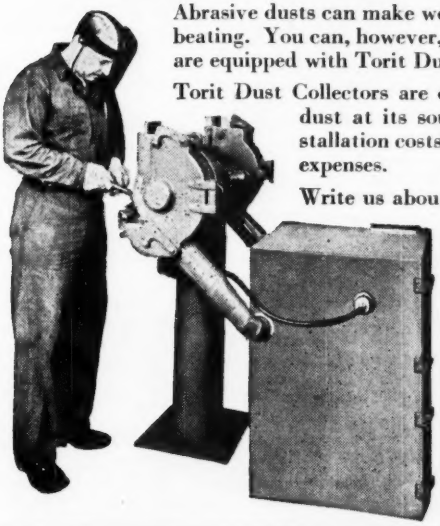
1. **Daisy Cutter**
2. **Coffin Corner**
3. **Rabbit Punch**
4. **Love All**
5. **Auk**
6. **Texas Leaguer**
7. **Chukker**
8. **Flying Mare**

Answers below this ad.

What's wrong with this picture of a professional heavyweight bout?

Knock out the dust problem in your plant with

TORIT DUST COLLECTORS



Abrasive dusts can make workers fighting mad, and give production a beating. You can, however, win every round if dust-causing machines are equipped with Torit Dust Collectors.

Torit Dust Collectors are compact, self-contained units. They trap dust at its source and recirculate the cleaned air. Installation costs are low, as are operating and maintenance expenses.

Write us about your dust problem. Most likely a Torit Dust Collector for your needs is in stock. If not, adaptations can be quickly made in our complete fabricating shop. Be sure to ask for our latest catalog.

TORIT

Manufacturing Co.

314 Walnut St. • St. Paul 2, Minn.

Pictures: Gloves are too heavy for a professional fight. Sport terms: 1, Baseball. 2, Football. 3, Boxing. 4, Tennis. 5, Golf. 6, Baseball. 7, Polo. 8, Wrestling.

Diversey Cleaners. Diversey No. 12, a reverse current electrocleaner for steel, copper, and copper alloys, and Diversey No. 36, an alkaline, non-etching aluminum cleaner, are thoroughly discussed in two file-folder-type pieces of literature available from The Diversey Corp., 53 W. Jackson Blvd., Chicago 4, Ill. Characteristics, advantages, and specific uses of the products are described.

Gaco Vinyl Finishes and Coatings. Many of the industrial maintenance and marine applications of Gates Vinyl coatings are described in an attractive two-color four-page brochure available from the Gates Engineering Co., Box 1711, Wilmington, Delaware.

Bulletin No. 112 describing its Controlled Humidity Method of Air Conditioning, together with a flow diagram, can be obtained from the Niagara Blower Co., 405 Lexington Ave., New York 17, New York.

One application of this equipment to the finishing industry is its use for controlling the humidity in curing rooms for set-up polishing wheels.

Inhibitor Bulletin. A four-page bulletin on the function and use of Hibitite acid inhibitor is available from Monsanto Chemical Co., St. Louis 4, Missouri.

The bulletin contains detailed instructions for inhibiting sulphuric, muriatic and phosphoric acids with Hibitite for pickling steels, removing metal coatings, cleaning equipment, and for the protection of iron and steel.

PAINT MIXER
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5 GALLON
PAINT REJUVENATOR
All paint restored to original consistency without opening the can.
2 minutes per gallon.
MIRACLE PAINT REJUVENATOR CO.
128 E. 10th St., St. Paul 1

Gold Plating Salts. Bart-Messing Corp., 45 Morgan Ave., Brooklyn 6, N. Y., has prepared a price list of its Sel-Rex Gold Plating Salts. One page of the leaflet is devoted to useful gold plating facts.

The **Interchemical Adherometer,** designed to measure the stripping force, in dynes, required to remove a paint film from the surface of a metal test panel, is the subject of an illustrated leaflet published by the Henry A. Gardner Laboratory, Inc., 4723 Elm St., Bethesda 14, Maryland .

Porter-Cable B-3 10-Inch Dry Belt Surfacer, which can be used horizontally or vertically, is shown and described in a bulletin available from the Porter-Cable Machine Co., 1708 N. Salina St., Syracuse 8, New York.

"Karbate" Brand Corrosion-Resistant Globe Valve. A copy of Catalog Section M-8803A completely describing and illustrating this valve may be obtained from the National Carbon Division, Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, New York.

Taylor Concentric Dial Indicators for transmitting, receiving, and controlling instruments are the subject of a four-page catalog section issued by Taylor Instrument Companies, 95 Ames St., Rochester 1, New York.

All-Metal Filter. In a four-page illustrated bulletin Green Manufacturing Co., 4539 W. Armitage Ave., Chicago 39, Ill., describes a line of stainless steel filters with filtering areas from 6 to 180 square feet and pumps from 0.5 to 5 horsepower.

Corrosion Resistant Linings and Coating Materials for tanks, fans, pumps, racks, baskets, anode bars, and so on, are the subject of a series of data sheets available from Industrial Lining Engineers, Inc., 3527 Smallman St., Pittsburgh 1, Pennsylvania.

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PHILADELPHIA, PA.

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Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N.Y., Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.

A copy of the ASTM and AES "**Specifications and Tests for Electrodeposited Metallic Coatings**" can be obtained from The International Nickel Co., Inc., 67 Wall St., New York 5, New York.

Hisey-Wolf Dust Collector. Bulletin No. 7-14 describing its Dust Collector and providing specifications together with a list of available sizes has been announced by The Hisey-Wolf Machine Co., Division of The Cincinnati Electrical Tool Co., Cincinnati 8, Ohio.

"**The 'Sales-Appeal' Look by Zapon Metalite Finishes**" is the title of a four-page folder describing Zapon Metalite Coatings manufactured by the Industrial Finishes Div., Atlas Powder Company, Stamford, Connecticut.

"**Tygon Flexible Plastic Tubing**" is the title of a 24-page illustrated booklet which provides complete information on all formulations of Tygon Plastic Tubing, its uses, properties, and chemical resistant characteristics, issued by the U. S. Stoneware Co., P. O. Box 350, Akron 9, Ohio.

Acid-Proof Construction Service. Chemsteel Construction Co., Inc., 5428 Walnut St., Pittsburgh 32, Pa., specialist in engineered acid-proof construction for all industries, has prepared an eight-page catalog discussing its complete facilities for designing and engineering, selection and procurement of materials, erection and maintenance. Typical examples are described and illustrated.

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HAMMOND SOLVENTS RECOVERY SERVICE
241 Brunswick St. Hammond, Ind.

Grinding and Polishing Equipment. The Hill Acme Co., 6400 Breakwater Ave., Cleveland 2, Ohio, has issued a three-page bulletin showing its divisions and products, including grinding and polishing machines for sheets and special shapes.

Publication of a revised edition of "**Products and Services of American Cyanamid Company for Industry and Agriculture**" has been announced by the American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y. This 64-page illustrated book briefly describes the products and services which Cyanamid offers to industry and various fields.

Duriron Price List H-2, illustrating all Duriron acid proof equipment now available for handling corrosive wastes, is available from The Duriron Co., Inc., Dayton 1, Ohio.

Chromium Plated Gages. The Cro-Plate Co., Inc., 3343 Main St., Hartford 5, Conn., has available a four-page illustrated bulletin describing its chromium plated "Cro-size" go-no-go and progressive-limit cylindrical plus gages.

Trushade Gold Solutions. A two-page folder discussing the advantages of Trushade Gold Solutions is available from Technic Inc., 39 Snow St., Providence, Rhode Island.

"**Step Up Production**" is the title of a 36-page booklet published by the Minnesota Mining and Manufacturing Co., St. Paul 6, Minn., which provides case-history examples and technical data on grinding and polishing with abrasive belts.

Abrasive belt techniques are described and pictured for a variety of materials and details given on belt equipment, belts, and various contact wheels. Also covered is the new "pre-finishing" technique in which the usual process of steel forming and then polishing is reversed in order to achieve maximum production line speed.

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Consumers! Engineers! Spraymen! *Everyone* is enthusiastic about Vedoc. Easy to apply, Vedoc's excellent coverage and opacity have solved many tough finishing problems. Or, if your finish requirements call for a hammered effect, *Ferro Hammeroc* is formulated to hold a uniform pattern on pieces of any size. No splatter coat of thinner, or special spray gun is required. For applications where heat might be a problem, special heat-resistant Hammeroc is available. Like to test these finishes? Drop us a note, with your baking schedule, you'll hear from us promptly.

Remember, Ferro Is Set Up to Provide Complete Organic Coatings Service. From the Development of Specialized Coatings to Designing and Installing Efficient Finishing Oven Systems.

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Peerless Surfacing Machines, both horizontal and vertical, for sanding, surfacing, and straight line finishing of die castings, forgings, plastic products, and so on, are pictured and described in a folder prepared by the Production Machine Co., Greenfield, Mass. Complete specifications are included.

White Enamel. A technical bulletin prepared by the Merrimac Division, Monsanto Chemical Co., St., Louis 4, Mo., describes the development of a speed bake white synthetic for reflecting surfaces of lighting fixtures. Advantages derived from the use of the coating, its specifications, and application possibilities are covered.

Pre-finished Metals. A data folder describing the properties, tempers, and finishes of pre-finished metals which are available in brass, zinc, aluminum, copper and steel bases has been prepared by the American Nickeloid Co., Peru, Ill. Complete information is furnished on Nickeloid Metals' bright and satin finishes offered in a wide selection of striped, crimped, and corrugated patterns.

Levelimeter Instruments. Catalog Section 75 describing the company's line of Levelimeter Instruments has been published by the Fischer & Porter Co., 75 County Line Rd., Hatboro, Pa. Illustrated and described in the 24-page catalog are magnetic tape-and-drum, electronically transmitting, ball-float, pneumatic and differential pressure units; V-notch weir and Parshall flume flowmeter instruments; and chemical service sight gauge glasses.

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Flame-otrol Combustion Safeguard for oil and gas-fired furnaces, ovens, boilers, kilns, and other heating equipment is discussed in Bulletin F2-1 released by the Wheelco Instruments Co., Chicago 7, Ill. The new 1300 Series Flame-otrols are described and illustrated, and a typical application diagram is included.

Rubber-lined Pipe and Fittings. Covering the subject in detail, a new eight-page catalog section on its rubber-lined pipe, fittings and valves has been issued by The B. F. Goodrich Company, Akron, Ohio.

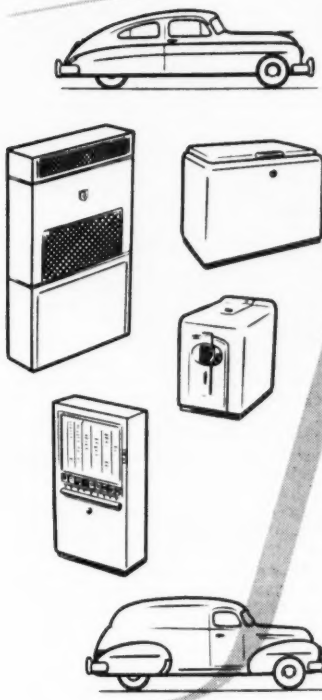
The catalog section describes the design, construction and service recommendations for the products. These include, besides rubber-lined pipe, gaskets for flanged pipe assembly, expansion joints, Flexseal connectors to reduce vibration in lines, Vulcalock valves, rubber-lined and relinable valves. Specifications and data are listed.

Nox-Rust Application Chart. The Nox-Rust Chemical Corp., 2429 S. Halsted St., Chicago 8, Ill., has available its revised Rust Preventive Use Chart, a comprehensive source of authentic data for rustproofing metal parts for protection against the elements. In easy-to-read tabular form, the chart provides the correct rustproofing methods for metal parts to be stored either indoors or outdoors, describes the application and removal of rust preventive materials, and designates the most suitable Nox-Rust product to be used. In addition, it indicates minimum protection periods, provides a physical description of each of the company's products, and other miscellaneous data.

NEW BOOKS

Determination of Impurities in Electroplating Solutions (A.E.S. Research Report Serial No. 6). By Earl J. Serfass, W. S. Levine, P. J. Prang, J. E. Oyler, R. M. Davis, and M. H. Perry. Published by the American Electroplaters' Society, P. O. Box 168, Jenkintown, Pa. 84 pages. Illustrated. Price, $1.25.

An addition to A.E.S. Research Report Serial No. 3 which was published in 1947, this book concerns the determination of



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BONDERITE—Corrosion Resistant Paint Base • PARCO COMPOUND—Rust Resistant • PARCO LUBRITE—Wear Resistant for Friction Surfaces

the following impurities in nickel electroplating solutions: silica, sodium and potassium, cadmium, aluminum, ammonium, chromium, zinc, and calcium.

New Products and Services. Published by the New York Journal of Commerce, 63 Park Row, New York 15, N. Y. Price, 50 cents.

More than 1,500 firms will be launching new products in 1950, ranging from simple household gadgets to complicated precision machinery. To familiarize the businessman with these innovations he may be able to use, sell, or be forced to compete against, a 1950 compilation of over 1,000 new products and services has been made available by the New York Journal of Commerce. Described in full detail, the study lists more than 750 of the leading manufacturers and their 1950 marketing innovations, cross-indexed by name and address as well as product.

Mineral Wool Insulation for Heated Industrial Equipment (Commercial Standard CS117-49). Published by the Industrial Mineral Wool Institute, 441 Lexington Ave., New York 17, N. Y. Single copies, free; larger orders, 15 cents per copy.

This Standard supersedes an earlier edition and includes new material on the installation of loose, granulated, and felted forms of mineral wool insulation. Nine additional and two revised line drawings on the application of blanket and board mineral wool are presented. Complete information is provided as to properties, standard sizes in which the various forms are available, how they are packaged, and how they should be installed to conform with accepted practice.

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• Strips readily—removes overspray with it. Pigmented white for light reflection. One gallon coats a standard booth.

SPECIALTY COATINGS LABORATORY

1721 NORTH WATER STREET

MILWAUKEE 2, WISCONSIN

Effect of Impurities and Purification of Electroplating Solutions. By D. T. Ewing and W. D. Gordon. Published by the American Electroplaters' Society, P. O. Box 168, Jenkintown, Pa., 36 pages Paper covers. Price, 90 cents.

Known as A.E.S. Research Report Serial No. 15, this publication is divided into two parts: a bibliography and a correlated abstract and critical review of nickel solutions in electroplating processes.

"Standard Grade" Hot-Dipped Galvanized Ware. Published by the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Price, 5 cents per copy.

This standard, CS161-49, effective from November 1, 1949, for new production, provides minimum requirements for material, workmanship, and construction of articles of hot-dipped galvanized ware. Also, recommended weights per dozen for finished ware and a recommended statement for indicating compliance with the standard are shown.

In addition, the booklet includes a brief history of this standardization project, a list of the acceptors, and the membership of the Standing Committee which will review future proposed revisions of this standard to keep it abreast of progress in the industry.

Disposal of Plating Room Wastes (A.E.S. Research Report Serial No 14). By B. F. Dodge and D. C. Reams. Published by the American Electroplaters' Society, P. O. Box 168, Jenkintown, Pa. 48 pages. Price, $1.00.

This critical review of methods of cyanide waste disposal is part of an investigation into the general field of plating room waste disposal, and is based upon as many references which the authors were able to obtain. They have taken as the scope of the review a consideration of all proposed methods of cyanide waste treatment, whether used or not, but with particular attention to such specific experimental data as are available for these methods. In order to furnish the necessary background for the discussion of the usefulness of the different methods of treatment described, the authors have also reviewed articles pertaining to the effects of cyanide wastes on streams and sewage treatment plants.

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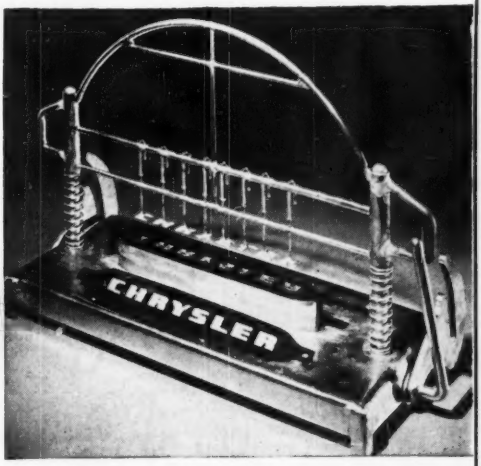

Often one color after another can be accurately wet painted on many concave, convex or irregularly shaped three dimensional parts. Eliminate makeshift masking devices.

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Faster, better, more economical than masking tape. Clean, sharply defined letters and decorative effects are obtained on intricately designed die castings, stampings, plastics, etc. Accurate control of painted areas with no fogged edges. Avoids after-wiping or buffing off of overspray. The "loose" inside of letters and numerals, such as "0" and "6", is held in position by arched bridging to effect characters without objectionable "ties." Can be fitted on fixtures on production lines. Used in production of hundreds of nationally known products.

Shown above is a plug-type masking fixture to plug and keep clean the depressed letters in a clear plastic automotive name plate while painting the background. To compensate for irregularities in the molded parts the fixture is cam-locked for pressure and the plugs for each individual letter are spring-loaded.

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I am interested in metal masking shields. Please send without obligation: ☐ Further information. ☐ Quotation on masks for parts (or prints) which I am forwarding.

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Wanted in certain territories to sell Schaffner's Buffing Compositions and Supplies. We specialize in White Finish (Lime Composition), Grease Stick, Tripoli, Emery Cake, etc., in "Bar or Liquid Form." All up to 100% saponifiable. These items can all be made to fit your particular customers' requirements. No account is too small or too large, for our individual attention. SCHAFFNER MANUFACTURING CO., INC., Schaffner Bldg., Pittsburgh 2, Pa.

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This well established lacquer and synthetic finishes manufacturing company is expanding its sales operations and requires the services of two technically able paint sales engineers with a following. Location within twenty-five miles of Phila. Area to be covered to include N. Y., N. J., New England, and parts of Pa. This is an excellent opportunity well worth investigating. Write in strict confidence with complete information to the American Lacquer Solvents Co., P O. Box 271, Phoenixville, Pa.

This Opportunity Section is available for classified advertisements. For advertising rates and other information address:

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Paul Maehler Variable Speed Conveyor Type Dip and Bake Oven complete with motors, blowers, controls and variable speed conveyor, steam and gas; inside width 7', length 90', height 10½'. Can be seen in operation. Very good condition.

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Manufacturer of Metal Parts, Washers, Vapor Degreasers, Dryers, in sales expansion program, has several desirable territories open for experienced salesmen. Salary plus commission. OPTIMUS EQUIPMENT COMPANY, Matawan, New Jersey.

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Complete 3 stage automatic metal cleaning machine plus dryer, designed for use with motorized conveyor. These units have been used for about 4 years and are in good condition. The 3 cleaning units are 10 feet long, the dryer unit is 11 feet long. Tunnel opening size is 20 inches wide x 6 feet high. These units can be seen in operation at Cincinnati, Ohio, for the next few weeks before dismantling for larger unit. Requires about 35 H.P. steam boiler to operate. Also available double hand spray booth and 46 feet of infra-red ovens. This equipment must be sold at once.

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Batch-Type, direct gas fired, complete with controls. Range 0-700° F. Ovens have two openings or doorways on front 53½" wide x 70¾" high. O.D. 14' x 9'6" deep x 6' high.

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One Kirk and Blum Oven

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Troy, Ohio

Catalogs

FOR YOUR LIBRARY

To obtain copies of the catalogs listed here, indicate on the coupon the number of the item in which you are interested and mail as directed.

1. Bright Dip

Instructions outlining a simple dipping process for producing a clear, bluish coating directly on zinc die castings are available in Unichrome Dip Bulletin 12, published by United Chromium, Inc., New York 17, New York.

2. Precious Metal Plating

A 20-page booklet issued by A. Robinson & Son, New York 2, N. Y., presents in usable form accepted methods applied in the electroplating of such articles as watch cases, insignia, jewelry, novelties, pen and pencil parts.

3. Polishing Accessories

The Manderscheid Co., Chicago 7, Ill., has issued Bulletin 103 describing the Presto line of work holding spinners, tube polishing machines, emery troughs, wheel rakes, and other accessories.

4. Dust Collectors

Catalog No. 34, published by the Torit Mfg. Co., St. Paul, Minn., outlines methods for collecting and cleaning dust-laden air from around industrial machines and includes complete information on the Torit line of self-contained and cyclone type dust collectors.

5. Copper Anode

Complete data covering its Lectrocop Plating Anode are contained in a bulletin distributed by Wagner Bros., Inc., Detroit 3, Michigan.

6. Dulac Clear Lacquer

Technical Data Bulletin 110 describing Dulac Clear Universal Lacquer No. 462 is available from the Mass & Waldstein Co., Newark 4, New Jersey.

7. Industrial Chemicals

A bulletin issued by the Harshaw Chemical Co., Cleveland 6, Ohio, lists alphabetically the chemicals supplied by the company to industries such as electroplating, ceramics, scientific laboratories, and so on.

8. Tumbling

"Precision Tumbling with Alundum Abrasives" is the title of a booklet, of interest to finishers of metal or plastic parts, which is now being offered by the Norton Co., Worcester 6, Massachusetts.

9. Emulsion Cleaner

Properties and operation of Ahcoloid Emulsion Cleaner are explained in detail in a booklet supplied by the Apothecaries Hall Co., Waterbury 88, Connecticut.

10. Conveyor Belts

A complete, basic reference on conveyor belts, designs, systems, and metallurgy is being offered by the Cambridge Wire Cloth Co., Cambridge, Maryland.

11. Flock Color Card

A color card illustrating 20 stock shades of flock in rayon, cotton, and wool can be obtained from the Claremont Waste Mfg. Co., Claremont, New Hampshire.

12. Oil and Water Extractor Bulletin

Full information regarding Binks oil and water extractors, used to purify compressed air before it reaches the spray gun, is contained in a bulletin available from Binks Mfg. Co., Chicago 12, Ill. Prices of the products are listed.

13. Rotary Automatic Polishing and Buffing Machine

Bulletin No. 45, issued by Hammond Machinery Builders, Inc., Kalamazoo, Mich., includes illustrations, descriptions, and specifications of the Hammond "Super" Rotary Automatic for grinding, polishing, buffing, and deburring.

14. Cleaning Machinery

An illustrated folder descriptive of its complete line of machinery for washing, rinsing, and drying metal parts is now being offered by the Cincinnati Cleaning and Finishing Machinery Co., Ironton, Ohio.

15. Abrasive Belts

Thirteen production reports from various manufacturers citing advantages of Resinall Metalite Belts are contained in a folder issued by Behr-Manning, Troy, New York.

16. Vapor Degreasing

"Vapor Degreasing with Du Pont Non-Flammable Solvents" is a title of a book on practical metal cleaning being issued by E. I. du Pont de Nemours & Co., Inc., Electrochemicals Dept., Wilmington 98, Delaware. Information included in the book concerns the application of vapor degreasing to metal cleaning problems.

The book is illustrated with application photographs showing vapor degreasing in various industries.

17. Metal Coating Specifications

"Specifications and Tests for Electrodeposited Metallic Coatings" is the title of a booklet which can be obtained from The International Nickel Co., Inc., New York 5, New York.

18. Infra-Red Ovens

Applications and advantages of Triangle Infra-Red Ovens are cited and illustrated in an eight-page catalog prepared by the Triangle Equipment Co., Inc., Nutley, New Jersey.

19. Abrasive Grains

The Exolon Co., Tonawanda, N. Y., has issued a folder describing Exolon abrasive grains and polishing procedures applicable to various industry groups.

20. Lyfanite Brochure 4998

A brochure outlining the process for producing Lyfanite, a corrosion resistant coating for aluminum alloys, is being offered by Neilson Chemical Co., Detroit 7, Michigan.

21. Organic Finishing

A 12-page technical bulletin outlining basic points to be considered in the planning of a complete organic finishing system has been prepared by Peters-Dalton, Inc., Detroit 12, Michigan.

22. Cleaners and Paint Strippers

Six technical bulletins describing paint strippers, cleaners, and phosphate coating materials are being distributed by Chemco Products Co., Inc., Chicago 19, Illinois.

23. A.C. Generators

A bulletin describing the construction and operation of Columbia alternating current generators is being issued by the Columbia Electric Manufacturing Co., Cleveland 14, Ohio.

24. Special Finishes

"Special Finishes for Special Applications" is the title of a catalog available from the Stanley Chemical Co., East Berlin, Conn., describing its variety of industrial coatings for increasing product utility value and sales appeal.

25. Abrasive Belt Head

Bulletin No. 17 issued by The Packer Machine Co., Meriden, Conn., describes Model No. 18 universal abrasive belt head and contains suggested applications of the device.

26. Water Wash Spray Booths

Specifications, construction features, line drawings, and photographs of Despatch Water Wash Spray Booths are included in Bulletin 66, published by the Despatch Oven Co., Minneapolis 14, Minnesota.

27. Uses for Paint Finishes

The National Paint, Varnish and Lacquer Association, Inc., Washington, D.C., has available an eight-page pamphlet entitled "Where Isn't A Finish."

28. Baking and Drying Ovens

Both batch and conveyor type baking and drying ovens are the subject of Bulletin 5 issued by the Young Brothers Co., Cleveland, Ohio.

29. Finishing Equipment

J. Holland & Sons, Inc., Brooklyn, N. Y., has published Folder "M" describing finishing equipment furnished by the company.

30. Burnishing Materials

The Abbott Ball Co., Hartford 10, Conn., has prepared data and charts illustrating and describing its line of burnishing materials.

31. Mechanical Finishing

Equipment and methods for mechanical finishing, deburring, polishing, Britehoning, and coloring various metals is described in an illustrated bulletin available from the Roto-Finish Company, Kalamazoo, Michigan.

32. Buffing and Polishing Compounds

The Mosher Co., Chicopee, Mass., has available a pocket-size guide for purchasers of buffing and polishing compounds which provides suggested uses for many Moco Compounds and lists other products and services of the company.

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431 Main St., Cincinnati 2, Ohio

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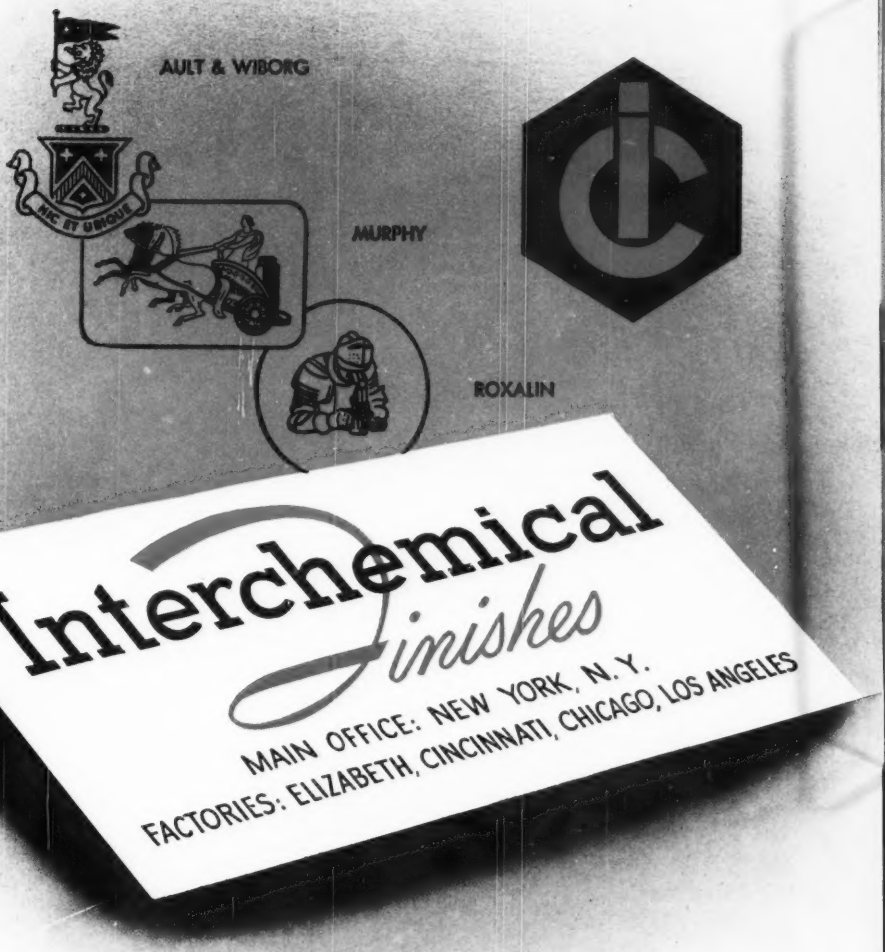

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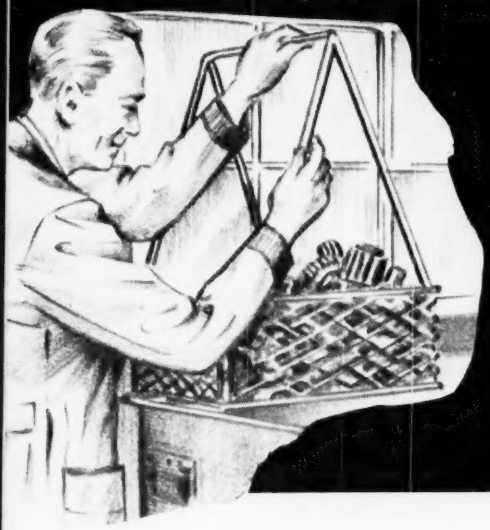

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